

WILDLIFE PROTECTION, MITIGATION, AND ENHANCEMENT PLAN

PALISADES PROJECT

Final Report

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ABSTRACT

Under direction of the Pacific Northwest Electric Power Planning and Conservation Act of 1980 and the subsequent Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program, projects have been developed in Idaho and Wyoming to mitigate the losses of **wildlife** habitat and annual production due to the development and operation of the Palisades Project. A modified Habitat Evaluation Procedure (HEP) was used to assess the benefits of the preferred mitigation plan to wildlife. The Interagency work group used the target species Habitat Units (HU's) lost with inundation of the reservoir area as a guideline during the mitigation planning process, while considering needs of **wildlife** in eastern Idaho and western Wyoming. A total of 37,068 HU's were estimated to be lost as a result of the inundation of the Palisades Reservoir area. Through a series of protection/enhancement projects, the preferred mitigation plan will provide benefits of an estimated 37,066 HU's. Target species to be benefited by this mitigation plan include bald eagle, mule deer, elk, mallard, Canada goose, mink, yellow warbler, black-capped chickadee, ruffed grouse, and peregrine falcon.

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INTROOUCTION

BACKGROUND

The Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Public Law 96-501) directed that measures be implemented to protect, mitigate, and enhance fish and wildlife to the extent affected by development and operation of hydropower projects on the Columbia River System. This act created the Northwest Power Planning Council, which in turn developed the Columbia River Basin Fish and Wildlife Program. This Program established a 4-part process:

- 1) Wildlife Mitigation Status Reports -- to identify mitigation proposed, mitigation required, mitigation implemented, and current studies and planning;
- 2) Wildlife Impact Assessments -- to quantify wildlife and habitat impacts;
- 3) Wildlife Protection, Mitigation, and Enhancement Plans -- to provide a plan to redress wildlife and habitat losses;
- 4) Implementation of protection, mitigation and enhancement projects -- to redress wildlife and habitat losses.

Wildlife mitigation proposed prior to project construction included enhancement of Grays Lake wildlife, principally waterfowl, through an exchange of Palisades water for Grays Lake water used to irrigate lands within the Fort Fall Indian Reservation, in combination with acquisition of 9,300 acres of private and 3,500 acres of public lands for wildlife management. In 1979, the U.S. Fish and Wildlife Service (USFWS) recommended that the U.S. Bureau of Reclamation (USBR) construct low dams at the upper end of the reservoir to create marsh type habitat; and that goose nesting islands, platforms, and other structures should be constructed near the impoundments. It also was recommended that the USBR purchase privately owned lands along the South Fork Snake River. Over the years, resource agencies have recommended that flows from Palisades Reservoir be regulated to minimize spring flooding and loss of waterfowl along the South Fork Snake River below the dam (Chaney and Sather-Blair 1985).

The reported wildlife mitigation requirement in the 1950 Congressional reauthorization of Palisades Project was reservation of "not to exceed 55,000 acre-feet of active capacity in Palisades Reservoir for a period ending December 31, 1952, for replacement of Grays Lake storage" (Public Law 81-864). This reservation of Palisades storage was intended to allow the USFWS time to negotiate a Palisades-Grays Lake water exchange. It subsequently was extended to December 31, 1955 by the Secretary of the Interior (Chaney and Sather-Blair 1985).

No implemented **wildlife** mitigation was **identified** in the Mitigation Status Report, which stated "NO structural measures have been implemented to mitigate for the loss of **wildlife** habitat due to the impoundment of Palisades Reservoir or for the loss of wildlife below the reservoir. " The USFWS was unable to resolve land ownership conflicts at Grays Lake and develop a water exchange and development plan acceptable to local people. On January 10, 1956 the USFWS recommended the storage reserved in Palisades Reservoir be released for other purposes (Chaney and Sather-Blair 1985).

In the section "Current Studies and Planning," Chaney and Sather-Blair (1985) reported that USBR personnel have annually met with the USFWS and Idaho Department of Fish and Game, since 1974, to discuss the forthcoming water year and projected spring flow releases from the reservoir. "The USBR has been responsive to flow requests within the constraints of water conditions (pers. commun., USBR) and so long as the recommended flows do not **conflict** with the authorized functions of irrigation and flood control (USBR 1979)" (Chaney and Sather-Blair 1985).

The **Wildlife** Impact Assessment for Palisades Project (Sather-Blair and Preston 1985) was completed in 1985. It **identified** net impacts of the project to target wildlife species, and is summarized in the next two sections of this report.

This mitigation plan for the Palisades Project was developed to fulfill the requirements of Section 1004(b)(3) of the Columbia River Basin Fish and Wildlife Program for Palisades Reservoir in eastern Idaho (Fig. 1). Using the Palisades Wildlife Impact Assessment as a guide, the interagency work group has attempted to develop a reasonable mitigation plan that addresses the impacts of hydroelectric development and operation at Pal isades, while considering the needs of wildl ife in the area.

Agencies that participation in the planning sessions include the U.S. Bureau of Reclamation (USBR), U.S. Bureau of Land Management (USBLM), US. Fish and Wildl ife Service (USFWS), Wyoming Department of Game and Fish (WDGF), U.S. Forest Service (USFS), and Idaho Department of Fish and Game (IDFG). Personnel from these agencies formed the Interagency work group. Throughout preparation of this plan, consultation and coordination were conducted with the above agencies and the Bonneville Power Administration (BPA) , Shoshone-Bannock Tribes, Northwest Power Planning Council, Peregrine Fund, and Pacific Northwest **Utilities** Conference Committee. This study was funded by the Bonneville Power Administration.

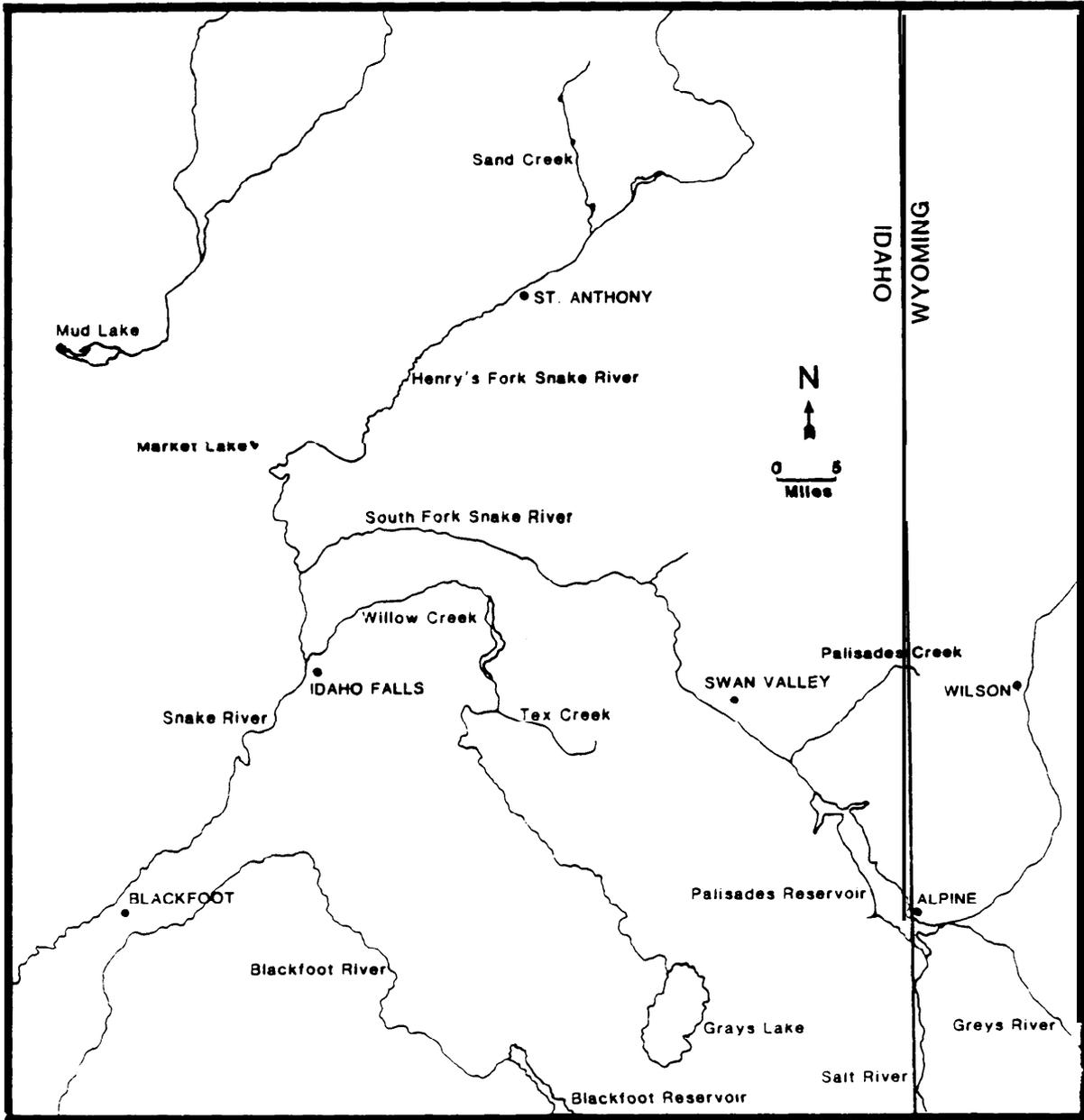


Fig. 1. Palisades Project and vicinity.

PALISADES PROJECT AREA DESCRIPTION

"Palisades Dam and Reservoir are located approximately 50 miles southeast of Idaho Falls, Idaho on the Idaho-Wyoming border. The project was originally authorized in 1941 and reauthorized in 1950 for irrigation, flood control, electric power production, recreation, and fish and wildlife (USBR 1978). Construction of the project began in 1951, and the dam and power plant were completed in 1957 and 1958 respectively. The project created a 15,600 surface-acre reservoir with over 1 million acre-feet of water storage capacity. The storage reservoir provides supplemental water for irrigating approximately 650,000 acres of land in the Snake River Plain as well as for flood control during spring runoff (USBR 1951)" (Sather-Blair and Preston 1985).

The existing Palisades power plant has a total installed capacity of 131 megawatts. The USBR is planning to upgrade the present 131 megawatt capacity to 178 megawatts. Construction activities would be confined within the existing powerplant building and are scheduled to occur from 1988 through 1992.

"Besides the 15,600-acre reservoir, the project also required approximately 500 acres for the dam site, borrow sites, and camp sites located immediately downstream of the dam. The USBR had to relocate U.S. Highway No. 26 around the north side of the reservoir and a 51-mile, 150-foot wide transmission line easement had to be purchased" (Sather-Blair and Preston 1985).

In most years, operation of the reservoir results in extreme fluctuations in reservoir surface elevation and water discharge to the South Fork of the Snake River during the period February to May when drafting of storage is being made to provide flood control space, and from May to July when filling of the flood control space is required to prevent downstream flooding. Storage releases from July to October follow a gradual trend to meet irrigation demand. Similarly, storage in the fall occurs when reservoir inflow exceeds minimum flow releases from the dam and also follows a gradual trend. The drop in water surface elevation during the July to October period has been as much as 60 feet, but has averaged 19 feet during the 25 year period 1961-85 (J. Woodworth, USBR, pers. commun.).

PALISADES PROJECT IMPACTS ON WILDLIFE

Sather-Blair and Preston (1985) summarized the Palisades Project impacts on wildlife:

"The Habitat Evaluation Procedure (HEP) was used to evaluate pre- and post-construction wildlife habitat conditions at Palisades Reservoir. Evaluation species were selected to represent important species groups or they were species of special concern. Impacts to evaluation species were measured in terms of the difference between pre- and

post-construction Habitat Units (HU's). Habitat Units are a measure of the quantity of habitat multiplied by the quality of that habitat. Quality of habitat is determined from a Habitat Suitability Index (HSI), which can range from 0 (poor habitat) to 1 (excellent habitat). In simple terms, one HU is equivalent to one acre of prime habitat (HSI=1.0).

"The study area of concern included the reservoir, (lands within 100 meters of the edge of the reservoir), Highway 26 and lands between it and the reservoir, the dam site, borrow areas, and staging areas immediately downstream of the dam. The study area totaled 18,565 acres.

"Eleven cover types were identified in the study area. All were reduced in area after project construction except lacustrine open water and emergent wetland (Table 1). The project resulted in a loss of 38 miles of riverine habitat. This included 1,677 acres of forested wetland, 832 acres of scrub-shrub wetland, and 900 acres of free-flowing river. Upland areas that were inundated or converted to other uses included 6,800 acres of farmland, 618 acres of coniferous forest, 1,203 acres of aspen, 2,913 acres of shrub-steppe vegetation, and 875 acres of grass/sage.

"It was estimated that the study area contained over 10,000 acres of big game habitat prior to project construction while it presently contains approximately 2,700 acres. Winter conditions in the study area reduce the overall quality of big game habitat and as a result the HSI for mule deer was 0.30. A loss of 2,454 HU's for mule deer occurred as a result of the project (Table 2). This loss is also considered representative for Rocky Mountain elk in the study area. Moose, black bear, and mountain lion were also affected by the project, but no habitat losses were estimated for these big game species.

"Other project-related losses include the annual winter loss of big game breaking through the ice on the reservoir and those dying as a result of vehicle collisions on Highway 26. Annual losses to the project-related factors are estimated to be between 10 and 20 animals.

"It was estimated that the study area contained 3,100 acres of aquatic furbearer habitat prior to construction while the reservoir currently has 2,783 acres along its shoreline. Using the mink model, the pre-construction habitat quality along the river and its tributaries was found to be high, while the reservoir currently provides poor quality habitat. A loss of 2,276 HU's was estimated for mink, which is also representative for other aquatic furbearers including beaver, muskrat, and river otter.

"Prior to project construction the study area contained 3,200 acres of waterfowl breeding habitat along the river and its tributaries, while the reservoir area currently has only 650 acres suitable for nesting. The quality of habitat along the river for ducks was high, while the reservoir currently provides poor habitat. Using a mallard model, an estimated loss of 2,622 HU's for waterfowl occurred as a result of project construction.

Table 1. Summary of cover type impacts associated with construction and operation of the Palisades Project, South Fork Snake River (Sather-Blair and Preston 1985).

Cover Type	Pre- construct ion Acres	Post- construct ion Acres	Impact Acres
Forested wet l and	1,715	38	-1,677
Scrub-shrub wet l and	874	42	-832
Emergent wetland	59	127	+68
Riverine rock bottom	900	0	-900
Lacustrine open water	0	15,600	+15,600
Agricultrue	6,800	0	-6,800
Ccnlferous forest	1,352	740	-612
Aspen	2,116	880	-1,236
Shrub-steppe	3,284	338	-2,946
Grass/sage	1,465	590	-875
Other1	0	210	+210
Totals	18,565	18,565	

Table 2. Summary of wildl ife hatitat impacts associated with construction and operation of the Palisades Project, South Fork Snake River (Sather-Blair and Preston 1985).

Group/ Evaluation-Species	Pre-construct ion HU'S	Post-construct ion p HU's	Impact HU's
BIG GAME			
Muie deer	3,242	788	-2,454
FURREARERS			
Mi nk	2,666	390	-2,276
WATERFOWL			
Mal lard	2,752	130	-2,622
Canada goose	935	130	-805
UPLAND GAME			
Ruf fed grouse	3,065	734	-2,331
RAPTORS			
Bald eagle - breeding	13,367	7,426	-5,941
Bald eagle = wintering	18,565	0	-18,565
NONGAME			
Balck-capped chickadee	1,389	31	-1,358
Yel low warbler	752	36	-716
Total impact (HU's)			-37,068

1 Includes dam, powerhouse, U.S. Highway 26) and government camp,,

"The study area contained approximately 1,948 acres of suitable Canada goose habitat prior to construction, while the reservoir currently has 650 acres. An estimated loss of 805 HU's for Canada geese occurred as a result of the project. A comparison of flow conditions on the South Fork below the dam between pre- and post-construction periods could not substantiate claims that water releases from the dam were causing more Canada goose nest losses than flows in the river prior to construction.

"It was estimated that the study area contained 3,831 acres of ruffed grouse habitat prior to project construction, while it currently has 918 acres around the reservoir. The habitat quality for ruffed grouse was and currently is high with an HSI of 0.80. An estimated loss of 2,331 HU's for ruffed grouse occurred as a result of project construction. There were also habitat losses for blue grouse, sage grouse, mourning doves, and cottontails, although these losses were not quantified.

"The habitat quality for breeding bald eagles in the study area prior to construction was considered moderately high (0.72 HSI), while current conditions are considered moderately low (0.40 HSI). A loss of an estimated 5,941 HU's for breeding bald eagles occurred as a result of the project. The reservoir currently provides no wintering habitat for bald eagles, while the study area prior to the project was considered prime habitat. A loss of 18,565 HU's for wintering bald eagles occurred as a result of the project.

"An estimated 29 osprey nests currently are active around the reservoir. The study area currently provides more and better habitat for osprey than occurred previously along the river. [HU's were not assigned to the gain of osprey habitat because the osprey is the only raptor species that benefited from the Project, while the other 15 raptor species found in the vicinity lost habitat as a result of the Project.]

"Forested and scrub-shrub wetland communities provide habitat for a variety of nongame as well as game species. Using the black-capped chickadee and yellow warbler models, estimated losses of 1,358 HU's for forested wetland dependent species and 716 HU's for scrub-shrub dependent species occurred as a result of the project. Sandhill crane habitat declined as a result of the project, but the reservoir's mudflats probably provide more feeding habitat for migratory shorebirds than was previously available along the river" (Sather-Blair and Preston 1985).

Impacts to the wildlife in Wyoming were examined because a portion of Pallsades Reservoir extends into the state. A total of 2,483 HU's (Table 3) and 890 acres (Table 4) were estimated to be lost in Wyoming as a result of the Pallsades Project.

Table 3. Summary of wildlife habitat impacts associated with Palisades Reservoir in Wyoming. Following Sather-Blair and Preston% (1985) methods, the Impact assessment area Included the reservoir and a 100 meter study area boundary (total studv area = 1,310 acres).

Species	Estimated HU's Lost
Mule deer	5
Mink	269
Mallard	230
Canada goose	92
Ruffed grouse	21
Yellow warbler	74
Black-capped chickadee	63
Bald eagle - breeding	419
Bald eagle - wintering	<u>1,310</u>
Total	2,483

Table 4. Summary of cover type Impacts associated with Palisades Reservoir in Wyoming.

Cover Type	Acres inundated
Agriculture	569
Forested wetland	78
River	129
Scrub-shrub wetland	86
Shrub-steppe	<u>8</u>
Total	890

METHODS AND MATERIALS

SELECTION OF TARGET SPECIES

During the Wildlife Impact Assessment planning process, target species were chosen by an Interagency work group to represent wildlife affected by the Pallsades Project. The species were chosen either because they are of high priority according to state or federal programs, or because they are indicator species used to best describe habitat conditions for groups of species with similar habitat needs. During this mitigation planning process, the Interagency work group agreed to use the same target species, to add Rocky Mountain elk to the big game category previously represented only by mule deer, and to add the peregrine falcon.

RESPONSIBILITY OF HYDROPOWER TO MITIGATE WILDLIFE LOSSES

The Pallsades Project is a multipurpose water resource development involving irrigation, power, flood control, recreation, and fish and wildlife. The reservoir formed by Pallsades Dam has a total capacity of 1,401,600 acre-feet, of which 44,700 is dead storage, 155,300 is inactive storage, and 1,201,600 is active storage. The 200,000 acre-feet of inactive and dead storage is used for minimum power head. The 1,201,600 acre-feet of active space is used jointly for irrigation, flood control, and power generation (USBR 1970).

Development and operation of the Pallsades Project inundated approximately 15,600 acres in the late 1950's, and resulted in substantial losses of wildlife and wildlife habitat (Sather-Blair and Preston 1985). Although wildlife production has been lost annually for about 30 years, none of these losses have been mitigated at this time (Chaney and Sather-Blair 1985).

The Pacific Northwest Electric Power Planning and Conservation Act of 1980 (section 4(h)(10)A), states that "the Administrator shall use the Bonneville Power Administration fund and the authorities available to the Administrator to protect, mitigate, and enhance fish and wildlife to the extent affected by the development and operation of any hydroelectric project of the Columbia River and its tributaries..."

Because Pallsades is a multipurpose project, there has been considerable debate over the amount of mitigation that hydropower beneficiaries should be responsible for. This complex issue has been examined from economic, operational and habitat standpoints.

Financial Feasibility of Project

The Pallsades Project was originally authorized in 1941, but construction was not started until 1952 following its reauthorization

under the Act of 1950 (Public Law 864). The Project was reauthorized substantially in accordance with the USBR supplemental report of July 1, 1949, under provisions of Section 9 of the Reclamation Project Act of 1939 (53 Stat. 1187).

Under the Reclamation Act of 1939, projects are authorized based on economic justification and financial feasibility. Section 9(a) of the Act states "if the proposed construction is found by the secretary to have engineering feasibility, and if the repayable and returnable allocations to irrigation, power, and municipal water supply or other miscellaneous purposes found by the secretary to be proper, together with any allocation to flood control or navigation made under subsection (b) of this section, equal the total estimated cost of construction and determined by the secretary, then the new project... shall be deemed authorized." Thus, financial feasibility of water projects is indicated by the prospect of full recovery of all reimbursable costs from water users and power users.

The total estimated cost of the Pallsades Project was \$76,601,000 (USBR 1949). Of this total, \$31,834,300 was allocated to flood control, fish and wildlife, and recreation. This cost was considered nonreimbursable to the U.S. Treasury, as provided in the Reclamation Project Act of 1939.

The \$44,766,700 cost allocated to irrigation and power was considered reimbursable to the U.S. Treasury. It was determined that repayment by irrigation water users would be limited by an ability to pay, up to a maximum of \$10,305,000. The rest of the costs allocated to irrigation (\$11,419,400) would be repaid by some form of power revenues. Interest on the cost of the power facilities would be applied to the extent necessary against the excess irrigation costs. In addition, \$23,042,300 was allocated to be repaid directly from power revenues. In a January 1950 letter to the U.S. Bureau of Reclamation, the Federal Power Commission stated "the importance of power to the project is evidenced by the fact that it carries the largest allocation of the three principal functions and would be responsible for 77% of the reimbursable costs."

Estimated project costs and repayment schedules have changed somewhat since the supplemental report of 1949. In the revised 1985 Pallsades Project statement of project construction cost and repayment, the estimated total cost for the project is \$74,516,313. This includes \$4,171,530.00 in costs assumed from the Michaud Flats and Fort Hall Indian Lands, Michaud Division Irrigation projects. The anticipated total reimbursable repayment from power and irrigation is \$42,421,775. Of this total reimbursable repayment, \$34,117,185 (80%) is expected to come from power revenues. The repayment from power includes \$4,171,530.00 toward the Michaud Flats and Fort Hall Indian Lands, Michaud Division Irrigation projects.

The Pallsades Project is similar to other water projects in the west where repayments from power revenues and the interest component earned on power investments offset deficiencies in the repayment ability of water users. As the Secretary of the Interior (1951) points out,

repayment from the interest component earned on power investment makes it possible to undertake a number of economically justifiable projects that otherwise could not be initiated because the cost of irrigation facilities is beyond the capacity of the water users to repay within a reasonable period of time.

An example of this was the Folsom Dam in the Central Valley area of California "...where a situation analogous to that within the Columbia Basin exists" (Secretary of the Interior 1951). "The income from the disposition, under federal reclamation laws, of the power there produced would assist not only in amortizing the cost of the Folsom Dam and power plant, but also in paying an appropriate share of the cost of irrigation canals and other works needed to distribute water from Folsom Reservoir to irrigation districts, cities, and suburban areas. Unless this income from power revenues is provided for in accordance with established practice under reclamation law, many related developments proposed in Central Valley, particularly in the American River Basin and nearby areas of California, will not be financially feasible (H. Doc. 496, 80th Cong.)" (Secretary of the Interior 1951).

The Palsades Project would not have been financially feasible without the hydroelectric development, and may not have been built. Hydroelectric development is the major revenue producer of the three major project functions (including irrigation and flood control) and in a sense carried the project through the repayment of reimbursable costs (80%) to the U.S. Treasury. Therefore, power beneficiaries should take full (100%) responsibility for the funding of mitigation for wildlife losses from the Palsades Project.

Operations

Palsades Reservoir is operated for irrigation as part of a system comprising three major reservoirs (including Jackson Lake and American Falls). Palsades Reservoir is primarily a hold-over reservoir to provide a supplemental water supply for existing projects (comprising 650,000 acres) in dry years (USBR 1951). "The holdover storage accumulated both in Palsades and Jackson Lake Reservoirs may remain untapped for periods of several years, but will be available for use during dry periods" (USBR 1951).

Taking into account the use of space in American Falls Reservoir for new lands, the operation study showed that by adding Palsades Reservoir to the storage system, an average of 216,000 acre-feet of additional water would be available annually. Of this amount, 147,000 acre-feet would be stored in and delivered from Palsades Reservoir (USBR 1951).

The Palsades Definite Plan (USBR 1951) states, "It should be recognized, however, that the average delivery of 147,000 acre-feet annually is fixed by the demand for supplemental water and is not a measure of the full capability of the reservoir. If there were a demand for 1,200,000 acre-feet of supplemental water every year. Instead of only in extremely dry years, the reservoir storage right would yield

an average of approximately one-half million acre-feet annually. Such a demand does not exist, however, because the existing reservoirs meet all storage water needs in years of above-average stream flow." Therefore, of the total storage capacity of 1,401,600 acre-feet in the Pallsades Reservoir, an average of 147,000 acre-feet (10%) is used annually for irrigation.

An average of 4,890,266 acre-feet of water annually flow through the Pallsades Reservoir system. Power generators at the rated head will utilize discharges of 8,000 cubic feet per second (cfs). Based on an analysis of Pallsades elevations and discharges by month, about 78% (3,814,407 acre-feet) of annual Pallsades discharges go through the turbines and are used for power.

Habitat

From a habitat standpoint, the capacity of a single-purpose power project required to produce power benefits equivalent to those of the Pallsades Project is 856,000 acre-feet (USBR 1970). Taking into account the physical characteristics of Pallsades Reservoir, 856,000 acre-feet of water would cover 11,116 surface acres. This is 71% of the total 15,600 surface acres of the Pallsades Project.

Flood Control

Studies conducted by the Corps of Engineers during project planning showed that flood damages caused by flows of up to 20,000 cfs could be eliminated more economically by construction of flood control structures in the form of levees. As a result, 18 miles of levees through the Heise-Roberts area was authorized in conjunction with the Pallsades Project (USBR 1949). These levees were constructed with sufficient free board to allow safe passage of 30,000 cfs during major floods. Hence, the importance of storage capacity in the reservoir for flood control was lessened because of the protection provided from the levees, revetments, and other channel improvements below the reservoir.

Power and Irrigation Ties

The Snake River Country pamphlet published by the Pacific Northwest River Basins Commission and Washington Sea Grant Program stated: "Irrigated agriculture would not be the cornerstone of the Basin's economy without the early development of electricity. In fact, energy development and agriculture grew up together in the Snake River Basin. In the early 1900's, it became evident that pumps were needed to lift water to irrigate much of the basin's lands."

A portion of the power produced at the Pallsades Project is used to run irrigation pumps at the North Side pumping division of the Minidoka irrigation project and the Michaud Flats irrigation project. These two projects, which were authorized under the same Act as Pallsades

Reservoir (Public Law 864), total about 87,000 acres. The conversion of the majority of these acres from native vegetation to agriculture was directly the result of the availability of Pallsades power.

The conversion of native range to agriculture affects many wildlife species. While a few agricultural dependent species such as pheasants may initially respond positively to this conversion, valuable habitat for native wildlife species such as sage grouse, sharp-tailed grouse, pronghorn, mule deer, and elk is lost. Native range supports a diverse plant community and wealth of wildlife species. Land converted to agriculture is normally cultivated toward monoculture with little plant diversity, which in turn supports little wildlife diversity.

The impact of land conversion from native vegetation to agriculture was not examined in the Pallsades Wildlife Impact Assessment (Sather-Blair and Preston 1985), although it resulted directly from the development and operation of the Pallsades Project. During the impact assessment, the work group agreed that if losses to wildlife due to construction of the reservoir area were fully mitigated, then adequate compensation due to hydroelectric development would be recognized. The Pallsades wildlife impact assessment team was lenient in their final assessment of wildlife losses at the Pallsades project by only examining the 15,600 acre inundated area. Had the tie between irrigation and hydropower been examined in more detail, many more losses to wildlife and their habitats would have been attributed to the development and operation of the Pallsades Project.

Allocation of Construction Costs

The allocation of joint facilities construction costs to various project functions was examined as a possible procedure to determine hydropower responsibility. We concluded that this is not a suitable procedure for determining hydropower responsibility at the Pallsades Project. Allocation percentages to project functions can vary considerably based on the particular method used.

A combination of three different methods was used to determine joint cost allocations for the Pallsades Project. For the nonreimbursable function of flood control, joint costs were assigned equal to the capitalized value of the estimated annual benefits. The balance of the joint costs for other functions (irrigation and power) was allocated on the basis of the average of the "priority of use" and the "alternate justifiable expenditure" methods of allocation (USBR 1949). In a letter to the Secretary of the Interior, the Bureau of Budget stated, "In the absence of accepted methods of allocating costs, we can only question the justification for the procedure adopted in connection with the proposed Pallsades Project" (Secretary of the Interior 1951).

The USBR (1961) stated that prior to the adoption of more recent methods of cost allocation, "several other procedures had been employed by the various agencies engaged in the water resource development

programs. It was found through experience that these procedures were unsuitable for one reason or another and consequently they were abandoned."

The USBR (1961) goes on to state, "The methods of cost allocation initially employed by the Bureau of Reclamation were based upon physical criteria such as 'use of space' or 'water released.' However, it was found that such methods of allocation did not properly measure the extent of use by the various functions involved. ... The physical approach to cost allocation was also unsatisfactory in that it did not provide a common denominator for all functions involved."

Under the "priority of use" method of allocation at the Palisades Project, all remaining joint costs (after nonreimbursable costs were pre-allocated) were assigned to irrigation because it had prior use of active space over power. However, the 1,201,600 acre-feet of active space is used jointly for irrigation, flood control, and power generation (USBR 1970).

"The alternative justifiable expenditure method limits the allocation to any function to the justifiable expenditure which is the lesser of the benefits or the cost of securing the same benefit through the most likely alternative means. ... While this method of cost allocation met the objections inherent in those procedures based solely on benefit or physical criteria, it involved other aspects which were objectionable.

"This procedure depends on the arbitrary segregation of facilities into joint (those which serve more than one function) and into specific (those which serve only a single function). In this procedure, the entire cost of the dam and reservoir is considered as a joint facility even though there may be dead storage which provided only power head, or exclusive storage space which serves only a single function such as flood control or irrigation. Also, in the application, it is assumed that imbedded penstocks in the dam or a powerhouse constructed in the dam are specific power facilities even though the elimination of such facilities would not result in a saving equal to the cost of the facilities removed. For example, if such facilities were removed, the voids left would have to be filled.

"Thus, the joint costs used under the alternative justifiable expenditure method may include, for example, that part of the storage capacity used exclusively for a single function. Also, the true costs of the specific facilities may be less than the cost normally regarded as the cost of specific facilities" (USBR 1961).

Another problem with the use of joint facility cost allocations as a procedure to determine hydropower responsibility is that a "disproportionate share of the costs of multipurpose dams is often assigned to navigation, flood control, or scenery enhancement" (Campbell 1986). At the Palisades Project, 65% of all joint facility costs were pre-allocated to flood control, because of the practice of allocating amounts equal to the capitalized value of the benefits of nonreimbursable flood control costs (USBR 1970). This leaves only 35%

of the joint facilities costs to be divided between irrigation and power. This is not an equitable nor a reasonable way of determining hydropower responsibility.

Summary

In summary, it is felt that hydropower beneficiaries should take full responsibility (100%) for the mitigation of wildlife losses due to the development and operation of the Palsades Hydroelectric Project. The Palsades Project would not have been financially feasible without the inclusion of the hydropower component, which is expected to ultimately be responsible for 80% of all reimbursable project costs. Quantified wildlife losses occurred with the inundation of the Palsades Reservoir area 30 years ago (Sather-Blair and Preston 1985). Other impacts to wildlife due to power (pump irrigation development) also occurred but were not quantified. Ratepayers have benefited from power produced at Palsades for 30 years, while 30 years of wildlife losses have gone unmitigated. Hydroelectric power is the principal revenue producing component of the project, and utilizes the majority (78%) of all water that annually passes through Palsades Dam. It seems reasonable that hydropower beneficiaries should take full responsibility for the mitigation of wildlife losses due to the development and operation of the Palsades Hydroelectric Project.

PROTECTION/ENHANCEMENT GOALS

The interagency work group agreed that a reasonable mitigation goal for wildlife impacts from the Pallsades Project would be to protect and/or enhance enough wildlife habitat to replace the value of habitat inundated by the reservoir. It was agreed that wildlife habitat should be protected and/or enhanced in both Idaho and Wyoming to compensate for each respective state's wildlife losses. The interagency group further agreed to use the target species Habitat Units lost (Sather-Blair and Preston 1985) as a guideline during the mitigation planning process, while considering the needs of wildlife in the area. These decisions were based on the following:

- 1) Wildlife need habitat to exist.
- 2) Wildlife provide many social, economic, and aesthetic benefits to people through a diversity of consumptive and nonconsumptive uses.
- 3) Habitat inundation attributable to hydroelectric development and operation at the Pallsades Project reduced, and continues to reduce, the wildlife that could be supported by habitat in the reservoir area had the project not been built.
- 4) The United States government, by passing the Northwest Power Act in 1980, acknowledged that the benefits of power production from hydroelectric projects were occurring at the expense of wildlife, and the benefits wildlife can provide have been, and continue to be, reduced. Acknowledging that tradeoffs have occurred between benefits of wildlife and benefits of hydropower, the Northwest Power Act directed the BPA administrator to use the BPA fund and available authorities "...to protect, mitigate, and enhance...wildlife to the extent affected by the development and operation of any hydroelectric project of the Columbia River and its tributaries..." (PL 96-501).

In early times, the wildlife resource seemed unlimited and negative impacts went unnoticed. However, needs of wildlife have become more and more apparent through time, with man's continued encroachment on declining amounts of wildlife habitat. As a result, the needs that wildlife have for habitat, and the needs that people have for wildlife, seem to far outweigh the wildlife losses attributable to the Pallsades Project. However, the authorization to protect, mitigate, and enhance wildlife under this program appears to be limited to the amount wildlife was affected by hydroelectric development and operation at the Project. Accordingly, the work group agreed to use the target species Habitat Units lost as a guideline during the mitigation planning process, while keeping in mind the needs of wildlife and the demand for wildlife resources in the area.

ASSESSMENT OF BENEFITS OF PROTECTION/ENHANCEMENT PROJECTS

Habitat Evaluation Procedure

The Habitat Evaluation Procedure (HEP) developed by the USFWS (1980) was used to estimate the benefits of projects in terms of Habitat Units (HU's). For a given species, one HU is equivalent to one acre of prime habitat. For each target species benefited by a project, the interagency team of biologists estimated the effect the project would have on the species Habitat Suitability Index (HSI). An HSI is a number between 0 and 1.0, and is a measure of an area's ability to provide the habitat requirements of a species. For a given species, prime habitat has an HSI of 1.0. Species models, comprised of measurable habitat variables, were used for guidance during HSI estimation. As much as possible, techniques to estimate HSI's and HU's were performed consistent with techniques used during the Wildlife Impact Assessment (Sather-Blair and Preston 1985).

Mitigation Credit

Estimated benefits of protection actions and enhancement actions were credited differently for mitigation. Credit for protection of private land was the total estimated HU's that would be provided by the parcel after management rights are acquired through fee-title acquisition or easement (willing sellers only), and after the area is enhanced through management actions. Credit for enhancement projects on lands administered by federal or state land management agencies was the estimate of HU's that would be increased on the project area as a result of the management action.

These methods and the accounting methods in the wildlife impact assessment were used in an effort to make mitigation accounting easier to understand than if the more appropriate technique of annualizing (USFWS 1980a) had been used. These simplified methods have resulted in liberal estimates of benefits and conservative estimates of losses.

Losses attributable to the Palisades Project were estimated as if they had occurred at one point in time, although losses of available wildlife habitats have been occurring for about 30 years. Likewise, mitigation credits for protection/enhancement projects have been estimated as if they will occur as soon as projects are implemented. However, benefits may not occur for several years until habitats improve and wildlife increase their use of enhanced areas.

If the projects in this plan are completed by 1990 and take only 4 years to produce the benefits estimated, by the year 2000 there will be only 6 years of benefits to mitigate 44 years of wildlife and habitat losses. We make this point to acknowledge the results of using simplified methods for mitigation accounting. The decision to use the simpler methods was based, in part, on good faith that annual operation and maintenance efforts would be funded for the life of Palisades

Project. As long as the Palisades Project is in place, inundation of wildlife habitat will continue, and hands-on management at enhancement projects will be necessary if the continuing hydropower impacts are to be mitigated to the extent wildlife is being affected.

ASSESSMENT OF COSTS OF PROTECTION/ENHANCEMENT PROJECTS

Advance Design

This includes the estimated costs of preparing management plans for enhancement work, soliciting bids and quotes, negotiating management agreements, and associated labor and travel. For protection actions, willing sellers will be identified during advance design work. All options of acquisition of fee-titles versus conservation easements will be examined. Costs are based on estimates provided by biologists, land managers, and/or engineers.

Implementation

This includes estimated costs of protection and enhancement measures necessary to initially achieve desired project benefits. Protection costs include the easement or purchase price of land (based on appraised value of similar parcels), legal work and negotiations necessary for acquisition of easements or fee-titles from willing sellers (estimated @ \$3,000.00/parcel), and appraisals (estimated @ \$5,000.00/parcel).

The costs of acquiring conservation easements from willing sellers of private parcels is expected to be similar to actual fee-title acquisition of the same parcels. Current Idaho law regarding conservation easements requires that in most cases, in order to purchase a conservation easement, the purchasing agency must own land appurtenant to the parcel to be purchased. There are plans to submit a conservation easement bill to the Idaho Legislature in the future. A purpose of the bill would be to provide more flexibility in acquiring conservation easements.

Enhancement costs include actions to improve wildlife habitat, such as building dikes and islands, planting vegetation, and improving bald eagle nest sites. Implementation costs are based on estimates provided by biologists, land managers, and/or engineers.

Operation and Maintenance (O&M)

These are recurring annual costs necessary to achieve and sustain a project's estimated benefits to wildlife. Operation and maintenance includes work such as fence maintenance, weed control, water level control, nesting and perching structure maintenance, grazing management to maintain desired habitat conditions through management of livestock and operators, island rehabilitation, and associated labor and travel. Costs are based on estimates provided by biologists and land managers.

Monitoring

This includes the cost of collecting baseline biological data as well as periodic monitoring of all mitigation lands. Baseline data and monitoring are necessary to assess the effectiveness of proposed protection/enhancement measures. Using adaptive management, mitigation techniques will be changed if monitoring indicates that the desired mitigation results are not being obtained. Costs are based on estimates by biologists and land managers.

RESULTS AND DISCUSSION

Protection, mitigation, and enhancement projects in this section are listed under target species headings, although many projects were designed to benefit the greatest number of target species possible. Within each species section, under each respective state, projects are listed in order of priorities assigned by the interagency work group. The work group did not prioritize species, but did prioritize preferred projects (Table 12) for each respective state.

RAPTORS

BALD EAGLE

Biological needs

The bald eagle is presently federally listed as endangered in Idaho under the Endangered Species Act of 1973 (as amended). Historic declines in bald eagle populations resulted from early uncontrolled shooting by humans, widespread pesticide use, and loss of required habitat. The Draft Pacific States Bald Eagle Recovery Plan (DBERP) (USFWS 1984a) states, "Habitat loss continues to be and will probably continue as the most significant long-term threat to all bald eagle populations in the region."

Breeding bald eagles require large trees to support bulky nests. Tree species does not seem to be as important as tree size, branch form, and location, although certain tree species meet nesting requirements to a larger degree than others (Anthony et al. 1982). In Idaho, large cottonwoods (Populus spp.), ponderosa pines (Pinus ponderosa), and Douglas fir (Pseudotsuga menziesii) are used most frequently (USFWS 1984a).

Distribution of bald eagle nests appears to be related to the availability of food (fish, aquatic birds, carrion) early in the breeding season. An additional requirement for breeding sites appears to be close proximity to open water during early incubation (late March to early April) (Greater Yellowstone Ecosystem (GYE) Bald Eagle Working Team, 1983). The total bald eagle breeding season occurs from February through August.

Bald eagles are very sensitive to human disturbance during the breeding season. Human activities have caused abandonment of nesting territories and also resulted in reproductive failures (USFWS 1984a).

The most important component of wintering bald eagle habitat is an adequate food source. Wintering bald eagles often concentrate along riparian areas to forage in open water and marshy areas for fish and waterfowl. Ungulate carrion is an important alternative winter food source for bald eagles in some areas.

Existing Management Goals

The primary objective of the DBERP (USFWS 1984a) is to provide secure habitat for bald eagles and to increase population levels in specific geographic areas to delist the species.

The proposed management direction for Zone 18 of the Greater Yellowstone Ecosystem (USFWS 1984a), which includes the Henrys Fork and South Fork Snake River includes: (1) Coordinate intensive management planning to maintain and increase nesting populations and their habitat, (2) regulate recreational use, (3) protect habitat through exchange, easement, or purchase, (4) initiate research and locate nesting and feeding areas, (5) maintain wintering habitat and non-contaminated food source, (6) ensure maximum production, and (7) restock fisheries where needed.

GYE management plan goals include: (1) identify and resolve conflicts of ongoing and proposed land use, (2) ensure that the potential exists for adequate protection of all nesting pairs of bald eagles in the future, (3) maintain or enhance nesting habitat and prey base at all nest sites, and (4) ensure that potential nesting habitat is managed to allow for population expansion or compensation for lost habitat. The overall objective for the GYE bald eagle population is to achieve and maintain 62 breeding pairs fledging a 5-year average of 53 young per year (GYE Bald Eagle Working Team 1983). These goals have not yet been met.

A primary goal of the Targhee National Forest (TNF) is to "Provide habitat to contribute toward a recovered population of threatened and endangered wildlife" (TNF 1985).

A proposed management objective of the Bureau of Land Management is to maintain high quality riparian habitat along the Henry's Fork and South Fork Snake River and provide critical nesting and wintering areas for bald eagles (USBLM 1985).

Idaho Fish and Game management for raptors will be directed at preserving their habitat protecting and enhancing nest sites, and implementing the Bald Eagle Recovery Plan in Idaho, including nest site protection (Morache et al. 1985).

The Department will place special emphasis on the preservation and protection of riparian habitats. This will include (1) fencing to exclude livestock; (2) support of legislation to compensate private landowners who preserve riparian habitats; and (3) purchasing or acquiring easement to key riparian habitats. The Department will promote any reasonable efforts to rehabilitate damaged riparian habitats. It will further identify riparian zones used by any nongame species classified as Threatened or Endangered, a Sensitive Species or a Species of Special Concern and make every reasonable effort to preserve and enhance areas, whether through purchase rehabilitation, fencing, or other means (Morache et al. 1985).

Protection/Enhancement Goals

It was estimated that the construction of Palisades Reservoir and subsequent hydroelectric development resulted in a loss of 5,941 bald eagle HU's for the breeding season and 18,565 bald eagle HU's for the winter season (Sather-Blair and Preston 1985). The interagency work group agreed that a reasonable goal for protection/enhancement of the bald eagle is to replace those HU's lost, while considering the needs of bald eagles in the general area of Palisades Reservoir. However, during this planning process it was found that many of the wintering bald eagle Habitat Units lost cannot be mitigated in the general vicinity of Palisades Reservoir. As a result, other species projects should be considered as trade-offs for these unmitigated wintering bald eagle habitat losses.

Preferred Protection/Enhancement Projects (Idaho)

The following preferred projects benefit bald eagles. The projects are listed in order of the priorities assigned to Idaho projects by the interagency work group (Table 5). It should be stressed that most of the projects are designed for, and benefit, a variety of other target and non-target riparian dependent wildlife species.

South Fork Snake River protection/enhancement. -- Protect through acquisition of easements or fee-titles, and enhance, 3,200 acres of approximately 6,400 acres of private inholdings along the South Fork Snake River (SFSR). The interagency work group wishes to stress that land or easements will only be acquired from willing sellers. These private lands are along a relatively undeveloped 27 mile stretch of the SFSR, referred to as the "Area of Concern" in a Memorandum of Understanding (MOU) signed by 5 agencies² in 1981. This interagency group is very active in the management of the SFSR, and bald eagles are an important species in their management objectives. The MOU points out that (1) the area possesses a number of natural resources or potential resources of high value to Idaho and the nation, (2) the potential is high for conflict between various human uses of the resources in this area, and (3) the interagency group has no authority over the private lands which lie within the Area of Concern, and yet they are important to the integrity of some of the values of concern.

The SFSR below Palisades Reservoir supports the most extensive cottonwood riparian forest remaining in Idaho and one of the largest such ecosystems in the western intermountain region of North America. In 1980, it was identified as the most important fish and **wildlife** habitat site in Idaho (USFWS 1986). Nationwide, more than 70% of the riparian ecosystems have been altered. In some western states, riparian losses have been as high as 95% (Brinson et al. 1981).

The SFSR is essential habitat for bald eagles with 8 active nests located along its shoreline. This represents 35% of the entire nesting population in Idaho (USFWS 1986). During the winter, 40 to 60 bald eagles regularly winter along the South Fork, although as many as 80 have been counted.

The biggest threat to the conservation of the SFSR ecosystem is residential and recreational development of privately owned lands adjacent to the river (USFWS 1986). Protection and enhancement of 3,200 acres of key private parcels along the SFSR would follow closely the goals and objective of agencies involved on the SFSR MOU and with the management of the bald eagle.

Benefits: Protection and enhancement of 3,200 acres of private riparian parcels along the SFSR will benefit far more wildlife than just the bald eagle.

² The five agencies involved in the MOU include the USFWS, USFS, USBR, USBLM, and IDFG.

Riparian wetland areas represent less than 1% of the total land surface in Idaho, and yet acre for acre, they are the most important areas for fish and wildlife. The SFSR, with the associated forested, scrub-shrub, and emergent wetlands, supports a rich diversity of wildlife, estimated at over 260 species.

There are at least 2 historic nesting sites for peregrine falcons in the vicinity of the SFSR. Conservation of riparian wetlands will benefit both the endangered bald eagle and endangered peregrine falcon.

The SFSR provides important habitat for 14 of the 30 bird species identified by the USFWS as National Species of Special Emphasis. It also provides habitat for several USFWS Regional sensitive bird species. Numerous islands along the SFSR provide nesting habitat for Canada geese and other waterfowl. The river also provides high quality wintering habitat for waterfowl. Shrublands within the canyon area provide winter range for mule deer, elk, and moose. The following estimated benefits are based on protection followed by enhancement measures listed under costs below.

<u>Species</u>	<u>HU's</u>
Bald eagle - breeding	2,127
Bald eagle - wintering	3,200
Black-capped chickadee	1,084
Yellow warbler	170
Canada goose	185
Mink	305
Mallard	231
Ruffed grouse	1,362
Mule deer	<u>569</u>
Total	9,233

Costs: Protection costs are estimated to be \$2,648,000. This should be treated as a rough estimate because costs could vary widely among private parcels based on future land appraisals. Enhancement measures will include the construction of 25 to 50 goose nesting platforms, a fencing and riparian pasture management program, and revegetation of some agriculture lands; costs are estimated at \$40.00/acre. Annual operation, maintenance, and monitoring will be needed to sustain annual wildlife benefits.

Advance Design	100,000.00
Implementation (Protection and Enhancement)	<u>2,776,000.00</u>
Total	\$2,876,000.00
Operation and Maintenance	64,000.00
Monitoring	<u>8,000.00</u>
Total Annual Costs for Life of Palisades Project	\$72,000.00

Palisades Reservoir nesting territory protection -- Protect an existing bald eagle breeding territory through fee-title acquisition, easement, or land exchange. The nest was located in 1979 and has been active since then. It is located on USFS lands a few feet from 90 acres of private property. Future development of this 90 acres would likely destroy this breeding territory and be disruptive to the goals and objectives of agencies involved with bald eagle management.

Benefits: This project will benefit bald eagles by protecting an existing nest site and ensuring continued production of bald eagles.

<u>Species</u>	<u>HU's</u>
Bald eagle - breeding	504

Costs: Costs for protection of 90 acres of the breeding territory have been developed by USFS personnel. Costs would be lessened if land exchange is determined to be a viable alternative to acquisition of fee-title or easement. Land exchange holds some potential if adequate land for a future home site can be found in the general area of Palisades Reservoir and exchanged for the 90 acres in the bald eagle breeding territory. This will be examined during the advance design stage of this project. Treatment and maintenance of the nest site is proposed under the bald eagle nest sites enhancement project. Operation, maintenance, and monitoring will be necessary to maintain habitat quality, for eagles, on the 90 acre parcel.

Advance Design	15,000.00
Implementation	<u>458,000.00</u>
Total	\$473,000.00
Operation and Maintenance	1,000.00
Monitoring	<u>1,000.00</u>
Total Annual Costs	\$2,000.00

Henry's Fork Snake River protection/enhancement. -- Protect through acquisition of easements or fee-titles from willing sellers, and enhance, 535 acres of private land along the Henry's Fork Snake River. This prime riparian habitat is near the IDFG Market Lake Wildlife Management Area (WMA) and is threatened by future development.

Benefits: Benefits of this project are similar to the benefits of the South Fork Snake River riparian protection and enhancement project. Riparian wetland areas represent less than 1% of the total land surface in Idaho and yet, acre for acre, they are the most important areas for fish and wildlife. Breeding and wintering bald eagles would be benefited as well as a host of other wetland/riparian dependent species. This project will closely follow a goal of the IDFG Market Lake WMA, which is to purchase private land near the East Springs Marsh (IDFG 1986).

<u>Species</u>	<u>HU's</u>
Bald eagle - wintering	439
Bald eagle - breeding	343
Black-capped chickadee	104
Yellow warbler	274
Canada goose	5
Mink	391
Mallard	260
Mule deer	20
Total	<u>1,836</u>

Costs: Protection costs are estimated to be \$230,000. Enhancement practices (fencing, etc.) are estimated to cost \$20.00/acre. Annual operation and maintenance is estimated to cost \$3,000.00 to sustain enhancement benefits,

Advance Design	10,000.00
Implementation	<u>240,700.00</u>
Total	\$250,700.00

Operation and Maintenance	3,000.00
Monitoring	<u>1,000.00</u>
Total Annual Costs for Life of Palisades Project	\$4,000.00

Nest Sites enhancement - Palisades Reservoir, South Fork, Henrys Fork, Main Snake. -- Enhance existing and potential bald eagle nest sites through a combination of tree topping, pruning, thinning, planting, and nest structure improvements. There are specific tree and crown characteristics that are important in nest tree selection. There presently are 10 existing nest sites in the area. Bald eagle production losses may soon occur at existing nest sites if this project is not implemented.

Benefits: These enhancement measures will help ensure use of nest sites by nesting bald eagles and, consequently, continued production.

<u>Species</u>	<u>HU's</u>
Bald eagle - breeding	1,200

Costs: Costs will vary by site based on specific needs. They are averaged here based on cost estimates by USFS and IDFG personnel.

Advance Design	10,000.00
Implementation	<u>44,000.00</u>
Total	\$54,000.00

Operation and Maintenance	4,000.00
Monitoring	<u>1,200.00</u>
Total Annual Costs for Life of Palisades Project	\$5,200.00

Mud Lake and Market Lake winter bald eagle perches. -- Enhance bald eagle winter habitat by erecting a combination of 30 artificial perches on Market Lake and Mud Lake WMA's. These perches will provide immediate benefits to wintering bald eagles. In addition, 10 to 15 cottonwood seedlings will be planted near each perch site to provide future long-term benefits to wintering bald eagles. It is expected that live trees will take the place of artificial perches 20 to 50 years after the project is initiated.

Benefits: A lack of natural perches for foraging bald eagles and other raptors currently exists at Mud Lake and Market Lake WMA's. Winter perches can make previously unsuitable areas available to foraging eagles (R. Knight, pers. commun., in DBERP 1984). Other raptors in the area would also benefit from these perches.

<u>Species</u>	<u>HU's</u>
Bald eagle - wintering	754

Costs: Advance design will include the preparation of a management plan that will detail perch locations and expected results. Each artificial perch structure will include 4 posts and cross pieces. Total cost for artificial perch materials and cottonwood seedlings is estimated at \$17,700.00. It is projected that 10 man days of labor (\$80.00/man day) will be needed for construction of artificial perches and planting trees. Annual operation and maintenance will be needed to repair artificial perches and care for trees.

Advance Design	3,000.00
Implementation	<u>18,500.00</u>
Total	\$21,500.00
Operation and Maintenance	1,000.00
Monitoring	<u>1,000.00</u>
Total Annual Costs for Life of Palisades Project	\$2,000.00

Preferred Protection/Enhancement Projects (Wyoming)

The following project was developed by W DGF personnel as partial mitigation for bald eagle habitat losses in Wyoming caused by construction of Palisades Reservoir.

Bald Eagle nest sites enhancement - Palisades area. -- The goal of this project is to maintain the production integrity of 4 bald eagle nest sites in the vicinity of Palisades Reservoir in Wyoming. Potential habitat improvement practices include tree topping, pruning, thinning, planting, and nest structure improvements. One of the nest sites is on the Salt River, and the other 3 are on the Snake River.

Benef its: This project will help ensure that bald eagles continue to use these nest sites and that long term production will occur.

<u>Species</u>	<u>HU's</u>
Bald eagle - breeding	480

Costs: Advance design work will include a year to determine requirements for habitat management on 4 nest sites. Implementation will include 3 years of nest site enhancements. Annual operation and maintenance will be necessary to assure continued site productivity. Annual monitoring will provide a means of practicing adaptive management to modify and refine nest site improvements.

Advance Design	40,000.00
Implementation	<u>16,000.00</u>
Total	\$56,000.00
Operat ion and Ma i ntenance	2,000.00
Monitoring	<u>1,200.00</u>
Total Annual Costs for Life of Palisades Project	\$3,200.00

Table 5. Summary of bald eagle preferred protection/enhancement projects. The objective of these projects is to increase the overall productivity of the endangered bald eagle, and benefit a vast array of riparian dependent species, through protection and/or enhancement of key riparian habitat. In order to sustain annual benefits, annual operation, maintenance, and monitoring will be necessary throughout the life of the Palisades Project.

Preferred Projects	Costs		Bald Eagle Benefits (HU's)	
	Advance Design & Implementation	Annual O&M & Monitoring	Breeding	Winter
<u>Idaho</u>				
South Fork Snake River protection/enhancement (3,200 ac)	2,876,000	72,000	2,127	3,200
Palisades Reservoir bald eagle nesting territory protection (90 ac)	473,000	2,000	504	0
Henrys Fork Snake River protection/enhancement (535 ac)	250,700	4,000	343	439
Bald eagle nest sites enhancement	54,000	5,200	1,200	0
MUG Lake and Market Lake WMA's winter bald eagle perches	21,500	2,000	0	754
South Fork Snake River protection/enhancement (additional 2,000 ac)	1,797,500	45,000	1,329	2,000
<u>Wyoming</u>				
Bald eagle nest sites enhancement	<u>56,000</u>	<u>3,200</u>	<u>480</u>	<u>0</u>
Subtotals	\$5,528,700	\$133,400	5,983	6,393
Other Projects			<u>120</u>	<u>0</u>
Totals			6,103	6,393
Palisades Project Impacts (HU's)			-5,941	-18,565

NONGAME/RIPARIAN

The yellow warbler and black-capped chickadee were selected as target species for nongame/riparian species. The yellow warbler is an indicator species for scrub-shrub wetlands, and the black-capped chickadee is an indicator species for forested wetlands.

The yellow warbler and black-capped chickadee represent a multitude of wildlife species associated with riparian habitats. It is well documented that wildlife species use riparian zones and wetlands disproportionately more than other vegetation zones. The density and diversity of wildlife is greater in riparian areas than in any other habitat type (Odum 1979). Riparian wetlands provide many other ecological benefits, including reduction of floods and erosion, improvement of water quality, food chain support and nutrient cycling, and a variety of socio-economic functions.

YELLOW WARBLER (Indicator Species for Scrub-shrub Wetlands)

Biological Needs

The yellow warbler breeds throughout most of the United States and is a common breeder in scrub-shrub habitat in Idaho. Preferred nesting habitats for this insectivorous warbler are generally wet areas with abundant shrubs or small trees (Schroeder 1982). Areas of extensive forest with closed canopies are generally avoided (Hebard 1961), while areas of low deciduous growth are preferred (Morse 1973). A breeding bird census across the United States (VanVelzen 1981) was summarized to determine nesting habitat needs of the yellow warbler (Schroeder 1982). Approximately 67% of all censused areas dominated by shrubs were used while 100% of all shrub wetlands received use. Wetland shrub habitats also had the highest average breeding densities of yellow warblers. In Idaho, yellow warblers also occupy areas dominated by deciduous shrubs or narrow stream-side thickets (Larrison et al. 1967).

Existing Management Goals

The yellow warbler is closely associated with riparian habitat. Therefore, most management goals that pertain to riparian areas in Idaho affect yellow warblers. The IDFG will place special emphasis on the preservation and protection of riparian habitats. This will include: (1) fencing to exclude livestock, (2) support of legislation to compensate private landowners who preserve riparian habitats, and (3) purchasing or acquiring easement to key riparian habitats. The Department will promote any reasonable efforts to rehabilitate damaged riparian habitats. It will further identify riparian zones used by any nongame species classified as Threatened or Endangered, a Sensitive

Species, or a Species of Special Concern and make every reasonable effort to preserve and enhance areas, whether through purchase, rehabilitation, fencing, or other means (Morache et al. 1985).

Protection/Enhancement Goals

It was estimated that the construction of Palisades Reservoir and subsequent hydroelectric development resulted in a net loss of 716 yellow warbler HU's (Sather-Blair and Preston 1985). Yellow warbler HU losses closely reflect the loss of the scrub/shrub component of riparian habitat. Riparian wetland areas represent less than 1% of the total land surface in Idaho and yet, acre for acre, they are the most important areas for wildlife (USFWS 1986). The interagency work group agreed that a reasonable goal for protection/enhancement of the yellow warbler is to replace at least those HU's that were lost, through a series of protection/enhancement projects in the general area of Palisades Reservoir, given the importance of riparian habitat.

BLACK-CAPPED CHICKADEE (Indicator Species for Forested Wetlands)

Biological Needs

Black-capped chickadees generally prefer deciduous or riparian woodlands (Larrison and Sonnenberg 1968, Sturman 1968). Cadwallader (1980) found that black-capped chickadees were associated with riparian zones on the South Fork of the Boise River in southern Idaho. Chickadees are "insect gleaners" and serve as important insect predators in forested areas (Sturman 1968).

Black-capped chickadees are cavity nesters (Stauffer and Best 1980). Nesting habitat is often limited by the number of available snags (Schroeder 1983). Preferred nesting tree species include willows (Salix spp.) and cottonwoods and poplars (Populus spp.).

Existing Management Goals

Similar to the yellow warbler, the future distribution of the black-capped chickadee is closely tied to riparian area management goals in Idaho. IDFG riparian goals for nongame species are listed under "Existing Management Goals" for the yellow warbler.

Protection/Enhancement Goals

It was estimated that the construction of Palisades Reservoir and subsequent hydroelectric development resulted in a loss of 1,358 black-capped chickadee HU's (Sather-Blair and Preston 1985). Black-capped chickadee HU losses closely reflect the loss of the

deciduous forested wetland component of riparian habitat. Riparian wetland areas represent less than 1% of the total land surface in Idaho and yet, acre for acre, they are the most important areas for wildlife (USFWS 1986). The interagency work group agreed that a reasonable level of protection/enhancement for the black-capped chickadee is to replace at least those HU's that were lost, through a series of protection/enhancement projects in the general area of Palisades Reservoir, given the importance of riparian habitat.

PREFERRED PROTECTION/ENHANCEMENT PROJECTS

The yellow warbler and black-capped chickadee benefited from a number of other species specific preferred projects developed by the interagency work group. Projects that will protect and enhance riparian areas along the South Fork and Henrys Fork Snake River will be especially important to these nongame species (Table 6) and a host of other riparian dependent wildlife species. These projects are detailed in the preceding bald eagle section.

Table 6. Summary of preferred protection/enhancement projects that benefit nongame/riparian species. Projects are detailed in the bald eagle section. The objective of these projects is to protect and/or enhance key remaining riparian areas in eastern Idaho. In order to sustain annual benefits, annual operation, maintenance, and monitoring will be necessary throughout the life of the Palisades Project.

Other Species Preferred Projects	Benefits (HU's)	
	Yellow Warbler	Black-capped Chickadee
South Fork Snake River protection/enhancement (3,200 ac)	170	1,084
Henrys Fork Snake River protection/enhancement (535 ac)	274	104
South Fork Snake River protection/enhancement (additional 2,000 ac)	106	678
Other projects	29	0
Totals	579	1,866
Palisades Project Impacts (HU's)	-716	-1,358

BIG GAME

Rocky Mountain elk and mule deer are the target species being used to represent this group. Although elk habitat was adversely affected by the Palisades Project, the mule deer was the only target species used to evaluate the effects of the project on big game. Due to the important needs of elk in eastern Idaho, the interagency work group agreed that mitigation projects benefiting elk would be credited to big game mitigation. It was further agreed that when a project is expected to benefit elk and mule deer, the big game mitigation credit attributed to the project is the estimated benefit to the species most protected/enhanced by the project.

ELK

Biological Needs

Elk are herbivores that use a variety of habitats and usually migrate between seasonal ranges. Elk have certain basic habitat requirements including food, water, protection from the elements, and, where hunted, hiding cover and security areas. Availability and distribution of these habitat components on each seasonal range ultimately determine the distribution and numbers of elk that may be supported (Towelle et al. 1985).

Elk summer range in eastern Idaho is typically mountainous habitat. Long migrations to winter range are common. Much of the winter range in this area is low elevation sagebrush-grassland habitat. The severity of the winter, and associated snow depths, usually dictate the elevation that elk will move to during a winter.

Grasses or shrubs constitute the major winter diet. Browse (leaves and twigs of shrubs and trees) is important in shrub ranges, and grasses are important when available. The spring diet reflects a transition from winter to summer foods, with grasses often being most important. As summer nears, forbs become important, although leaves of browse species may be readily taken. Fall diets often revert to predominantly grass or browse (Peck 1982).

Existing Management Goals

IDFG statewide habitat-related goals for elk include the following:

- 1) Increase elk populations in areas where natural forage is available.
- 2) Acquire critical portions of elk range, especially when adjacent to ranges already managed by the Department and/or where such areas may be negatively impacted by land management or development actions.

- 3) Through purchase of fee-titles or easements, work toward maintaining migration corridors to elk habitat.
- 4) Work with federal, state, and private land managers to implement range rehabilitation measures on elk winter range.

IDFG habitat-related goals for elk in the mitigation areas include the following:

- 1) Purchase critical elk winter ranges currently in private ownership, and seek easements and cooperative agreements with private landowners.
- 2) Pursue an acquisition program for critical elk winter range on the Sand Creek big game range to reduce encroachment of agriculture on the west side of the winter range, which is reducing the unit's capacity to support elk and may block the migration route to southern portions of the winter range.
- 3) Allow the herd that winters on Tex Creek WMA to increase as habitat on the WMA is being developed.

MULE DEER

Biological Needs

Mule deer are herbivores that use a variety of habitats and usually migrate between seasonal ranges. Winter range is a critical component of mule deer habitat, and spring and summer-fall ranges are also very important (Trent et al. 1985).

Mule deer winter habitat in much of eastern Idaho is low elevation sagebrush-grass land range. Cover, aspect, and elevation are recognized as crucial components of winter range, where availability of thermal sites and forage is important. Loveless (1967, cited by Mackie et al. 1982) reported that snow depths of 20 inches or more precluded the use of an area by mule deer, Gilbert et al. (1970) found snow depths in excess of 18 inches to preclude deer use of an area. Winter diet is principally browse (leaves and twigs of shrubs and trees). The availability of adequate browse is often the limiting factor for mule deer populations over much of their range (Schneegas and Bumstead 1977).

Early spring is an important time of year for mule deer, and spring range is a key component of year-round habitat. Quality and quantity of nutritious forage in the spring has a major effect on mule deer production and survival (Walimc et al. 1977). Spring diet contains a high percentage of grasses (Hill 1956) as well as forbs and browse (Kufeld et al. 1973).

Summer-fall ranges are important because this is where deer produce fat reserves that allow survival through winter (Trent et al. 1985). Forbs and new shrub growth comprise most of the diet during this period (Schneegas and Bumstead 1977).

Existing Management Goals

IDFG statewide habitat-related goals for mule deer include the following:

- 1) Acquire and/or improve winter range.
- 2) Through purchase of fee-titles or easements, work toward maintaining access to habitat.
- 3) Purchase parcels within or adjacent to the boundaries of established wildlife management areas.

IDFG habitat-related goals for mule deer in the mitigation areas include the following:

- 1) Pursue land acquisition in Sand Creek area to reduce encroachment of agriculture on the west side of the winter range, which could result in increased competition between elk and deer for critical winter range.
- 2) Continue working with land management agencies on projects to rejuvenate winter ranges.
- 3) Continue and expand the program of use-trade agreements to improve and maintain winter range,

PROTECTION/ENHANCEMENT GOALS

The Wildlife Impact Assessment for the Palisades Project (Sather-Blair and Preston 1985) identified net losses of 3,178 acres of big game habitat, which provided important elk and moose habitat, and an estimated 2,454 HUs of mule deer winter habitat.

Due to the encroachment of agriculture on the west side of the Sand Creek big game winter range, available habitat is being reduced, and access to thousands of acres of traditional winter range is being threatened. Perpetuation of the Sand Creek elk and mule deer herds depends on the protection of the migration corridor and winter range. There are important big game winter habitat needs in many other areas also. Therefore, the interagency work group agreed that a reasonable goal under this program is to replace at least the 2,454 HUs identified as big game losses at palisades, while considering the needs of big game in eastern Canada.

PREFERRED PROTECTION/ENHANCEMENT PROJECTS

The following preferred projects were proposed specifically to benefit elk and/or mule deer. These projects are listed in order of the priorities assigned by the Interagency work group. Acquisition of easements or fee-titles is dependent upon willing sellers.

There were other protection/enhancement projects, developed during this planning effort, that would benefit big game. Benefits are presented in this section's summary (Table 7); the projects are detailed in the bald eagle section.

Sand Creek - Big Grassy protection/enhancement. -- This project is primarily for protection of one 5,000 acre parcel of critical elk and mule deer winter range and protection of the only migration corridor to additional IDFG and RLM-administered winter range in the area. The parcel is threatened by agricultural development. Enhancement measures will include fencing, grazing management, and forage improvements.

Benefits: Protection of this property will remove threats from agricultural development, help maintain the area's capacity to support wintering elk, and benefit wintering mule deer, resident sharp-tailed grouse, and many other sagebrush/grassland dependent species. Further, protection will help maintain the elk and mule deer migration route to thousands of acres in the southern portions of this winter range. It is generally considered that loss of this migration corridor would jeopardize the continued existence of this elk herd. This winter range is presently supporting 2,000 to 2,500 elk. This parcel and remaining nearby winter range provides the most critical range in the area during severe winters.

<u>Species</u>	<u>HU's</u>
Elk/Mule deer	4,000

Costs: Estimated implementation costs include \$633,000.00 for acquisition of an easement or fee-title if the seller is willing, and \$50,000.00 for range improvement measures. Annual operation and maintenance will be necessary to maintain the benefits of range improvements. Monitoring will be necessary to assess the benefits of the project and to practice adaptive habitat management.

Advance Design	25,000.00
Implementation	<u>683,000.00</u>
Total	\$708,000.00

Operation and Maintenance	10,000.00
Monitoring	<u>5,000.00</u>
Total Annual Costs for Life of Palisades Project	\$15,000.00

Sand Creek - Hook of the Sands protection/enhancement. -- This project is for protection and enhancement of a 4,880 acre parcel that exists at the narrowest portion of the migration corridor on this critical elk and mule deer winter range. This area was traditional winter range. About 2,800 acres of this tract currently being farmed would be converted back to native sagebrush/grass land range.

Benefits: Protection and enhancement of this tract will improve the area's capacity to support elk and mule deer and will protect this critical migration route. The tract is on what was possibly the most important portion of this critical elk winter range. Wintering mule deer, sharp-tailed grouse, and many other sagebrush/grassland species will also benefit.

<u>Species</u>	HU's
Elk/Mule deer	3,904

costs: Estimated implementation costs include \$2,228,000.00 for acquisition of an easement or fee-title if the seller is willing, \$560,000.00 for conversion of 2,800 acres of farmland to native range, and \$21,000.00 for range improvements on 2,080 acres of existing range. Operation and maintenance costs may need to include two years of watering using an existing irrigation system to ensure success of the grass seeding and shrub planting. Annual operation and maintenance will be necessary to maintain the benefits of range improvements. Monitoring will be necessary to assess the benefits of the project and to practice adaptive habitat management.

Advance Design	52,500.00
Implementation	<u>2,809,300.00</u>
Total	52,371,500.00
Operation and Maintenance	48,000.00
Monitoring	<u>4,000.00</u>
Total Annual Costs for Life of Palisades Project	\$52,000.00

Sand Creek - South Junipers protection/enhancement. -- This project is for protection and enhancement of a 3,160 acre parcel that provides critical mule deer winter habitat. The area supports 1,500 to 2,000 mule deer, and is threatened by agricultural development.

Benefits: Protection of this property will help maintain the area's capacity to support wintering mule deer. Wintering elk, sharp-tailed grouse, sage grouse, and many other sagebrush/grassland species **will** also benefit.

<u>Species</u>	<u>HU's</u>
Elk/Mule deer	2,528

costs: Estimated implementation costs include \$403,000.00 for acquisition of an easement or fee-title if the seller is willing, and \$63,000.00 for range improvements. Annual operation and maintenance will be necessary to maintain the benefits of range improvements. Monitoring will be necessary to assess the benefits of the project and to practice adaptive habitat management.

Advance Design	25,000.00
implementation	<u>466,000.00</u>
Total	\$491,000.00
Operation and Maintenance	31,000.00
Monitoring	<u>2,000.00</u>
Total Annual Costs for Life of Palisades Project	\$33,000.00

Swan Valley protection/enhancement. -- The purpose of this project is to protect through acquisition of easements or fee-titles from willing sellers, and enhance, 750 acres of elk and mule deer winter range near Swan Valley, Idaho. The parcels have a mix of agricultural lands and native range. These private parcels lie in an area of historic deer and elk winter range, much of which has been converted to agricultural production. Most of the current native range is overgrazed both by livestock and big game. As native winter range has disappeared, conflicts between wintering big game and private landowners have increased.

Benefits: Protection and enhancement of these key private parcels will help increase the quality and quantity of winter range habitat for big game in the area and reduce big game depredation conflicts.

<u>Species</u>	<u>HU's</u>
Elk/Mule deer	525

Costs: Protection costs are estimated to be \$219,000.00 Based on a combination of browse plantings on native range and agricultural land conversion, wildlife forage enhancement costs are estimated at \$100.00/acre. Annual operation, maintenance, and monitoring will be necessary to maintain the benefits of range improvements. Monitoring will be necessary to assess the benefits of the project and to practice adaptive habitat management.

Advance Design	20,000.00
Implementation	<u>294,000.00</u>
Total	\$314,000.00
Operation and Maintenance	8,000.00
Monitoring	<u>1,500.00</u>
Total Annual Costs for Life of Palisades Project	\$9,500.00

Table 7. Summary of elk/mule deer preferred protection/enhancement projects. The objective of these preferred projects is to protect and improve key big game winter range. In order to sustain annual benefits to big game, annual operation, maintenance, and monitoring will be necessary throughout the life of the Palisades Project.

Big Game Preferred Projects	Costs		Elk/Mule Deer Benefits (HU's)
	Advance Design & Implementation	Annual O&M & Monitoring	
Sana Creek - Big Grassy protection/enhancement (5,000 ac)	708,000	15,000	4,000
Sand Creek - Hook of the Sands protection/enhancement (4,880 ac) ³	2,871,500	52,000	3,904
Sand Creek - South Junipers protection/enhancement (3,160 ac) ³	491,000	33,000	2,528
Swan Valley protection/enhancement (750 ac) ³	<u>314,000</u>	<u>9,500</u>	<u>525</u>
Subtotals	\$4,384,500	\$109,500	10,957
<u>Other Species Preferred Projects</u>			
South Fork Snake River protection/enhancement (3,200 ac)			569
Henrys Fork Snake River protection/enhancement (535 ac)			20
South Fork Snake River protection/enhancement (additional 2,000 ac) ⁴			<u>356</u>
Total			11,902
Palisades Project Impacts (HU's)			-2,454

³ Trade-off for wintering bald eagle losses that cannot be mitigated in the general vicinity of the Palisades Project.

⁴ Benefits for species other than bald eagle and nongame/riparian species are trade-offs for wintering bald eagle losses that cannot be mitigated in the general vicinity of the Palisades Project.

WATERFOWL AND AQUATIC FURBEARERS

The target species used to represent these groups are mallard, Canada goose, and mink. Projects to protect/enhance these species are grouped because the species use similar habitats, and projects that benefit one of these species tend to benefit all three.

MALLARD

Biological Needs

The mallard is a dabbling duck that depends on wetlands for successful nesting and brood production. Their diet consists primarily of aquatic plants; the presence of shallow-water feeding areas is critical (Johnsgard 1975). Nests are generally located on the ground in dense herbaceous vegetation, usually within 100 meters of water (Bellrose 1976). An important habitat-related factor that affects mallard populations is predator-caused nest failure (Bellrose 1976). In summary, mallard production is best in areas that have dense herbaceous vegetation close to water, and that are relatively safe from predators.

Existing Management Goals

IDFG management goals for mallards in particular and waterfowl in general include: 1) increase Idaho's resident duck populations, 2) protect and improve wetlands, and 3) continue work under the Northwest Power Planning Act to acquire adequate waterfowl compensation for habitat inundated by Palisades Reservoir (Will et al. 1986).

USFWS goals for the Snake River area of Idaho include maintaining wintering waterfowl habitats to support a mid-winter population of 500,000 mallards. Strategies for this goal include maintaining current amounts and quality of seasonal and permanent wetlands, and selectively acquiring critically needed habitat. The USFWS identifies continued loss of wetlands and riparian habitat as a current problem (USFWS 1980b).

Protection/Enhancement Goals

The Wildlife Impact Assessment for the Palisades Project (Sather-Blair and Preston 1985) identified net losses that included 38 miles of river and tributaries, several islands totaling 100 acres, and 2,622 mallard HUs. The interagency work group agreed that a reasonable goal to mitigate the Palisades Project impacts on dabbling ducks is to replace at least the 2,522 mallard HUs identified as losses directly attributable to the Palisades Project, while considering the needs of mallards in the general area of Palisades Reservoir. Recurring drought conditions in mallard nesting habitat in Canada, and subsequent large reductions in production, have contributed to record low mallard

populations nationwide. As a result, there is an important need to increase Idaho's resident duck populations by protecting and improving wetland habitats.

CANADA GOOSE

Biological Needs

Most Canada geese use of the extreme eastern Idaho area is for nesting and brood-rearing. Most geese nest very close to water on sites with good visibility. They prefer to nest on small islands, but they also nest on narrow peninsulas and along the water's edge. They readily use artificial nest structures, but these structures require annual maintenance. The primary causes of nest failure are desertion, predation, and flooding. Brood habitat includes open water, gentle bank slopes, and short succulent grasses and forbs for food. If adequate brooding habitat is close to nests, the birds will stay in the vicinity of the nest site throughout spring, summer, and fall. If brooding habitat is not available, adults will take the young elsewhere, sometimes several miles from the nest site. Such movements may result in increased mortality of the young (Will et al. 1986).

Existing Management Goals

IDFG management goals for Canada geese in particular and waterfowl in general include: 1) increase local goose populations, 2) protect and improve goose habitat for resident Canada geese, and 3) continue work under the Northwest Power Planning Act to acquire adequate waterfowl compensation for habitat inundated by Palisades Reservoir (Will et al. 1986).

USFWS goals for the Snake River area of Idaho include 1) maintain wintering waterfowl habitats to support a mid-winter population of 35,000 Rocky Mountain Canada geese, and 2) maintain 1,500 nesting pairs of Rocky Mountain Canada geese. Strategies for this goal include: preserve/enhance nesting sites, and preserve and enhance brooding habitat. As a current problem, the USFWS identifies decreased production of Canada geese along the Snake River because of loss and degradation of nesting and brooding habitats, with construction of dams being the cause of such habitat loss (USFWS 1980b).

Pacific Flyway Council goals for the Rocky Mountain Canada goose in the Pacific Flyway include 1) maintain the population size above the 3-year average of 50,000 geese as measured by the mid-winter inventory, while giving special consideration to individual breeding and wintering flocks, and 2) maintain the amounts of suitable breeding and wintering habitats. Escalated loss and degradation of habitat is identified as a problem (Subcommittee on Rocky Mountain Canada geese of the Pacific Flyway Study Committee 1953).

Protection/Enhancement Goals

The Wildlife Impact Assessment for the Palisades Project (Sather-Blair and Preston 1985) identified net losses that included 21 miles of river, several islands totaling 100 acres, and 805 Canada goose HU's. The interagency work group agreed that a reasonable goal to mitigate the Palisades Project impacts on Canada geese is to replace at least the 805 HU's identified as the losses directly attributable to the placement of Palisades Reservoir, while considering the needs of geese in the general area of Palisades Reservoir.

MINK

Biological Needs

Mink are predaceous mammals that use aquatic habitats and riparian and upland habitats within 100 to 200 meters of the water's edge (Melquist et al. 1981). Habitats associated with small streams are preferred to those with large, broad rivers. Also, wetlands with irregular and diverse shorelines provide more suitable habitat than those with straight open and exposed shorelines (Allen 1984). Mink feed on a variety of prey including fish, small mammals, and waterfowl. The presence of muskrats can be very important to mink populations.

Existing Management Goals

IDFG management goals for aquatic furbearers in general and mink in particular include: 1) cooperating with land managers to implement habitat management programs, and 2) maintaining an annual harvest of mink.

Protection/Enhancement Goals

The Wildlife Impact Assessment for the Palisades Project (Sather-Blair and Preston 1985) identified net losses that included 38 miles of river and tributaries and 2,276 mink HU's. The interagency work group agreed that a reasonable mitigation goal for aquatic furbearers is to replace at least the 2,276 mink HU's identified as the losses directly attributable to the Palisades Project, while considering the needs of aquatic furbearers in the general area of Palisades Reservoir. There are continuing losses and degradation of wetland habitats in eastern Idaho. To meet the goals of habitat improvement and perpetuating mink harvests under conditions of declining habitat, aquatic furbearer habitat protection/enhancement is necessary.

PREFERRED PROTECTION/ENHANCEMENT PROJECTS (Idaho)

The following projects were specifically designed to benefit waterfowl and aquatic furbearers. These projects are listed in order of the priorities assigned by the interagency work group.

There were other protection/enhancement projects, developed during this planning effort, that will benefit mallards, Canada geese, and/or mink. Benefits are presented in this section's summary (Table 8); the projects are detailed in the bald eagle section.

Market Lake WMA Triangle Marsh enhancement. -- This project will convert 350 acres of intermittent marsh without water control and with relatively low-quality habitat into 350 acres of permanent marsh with water control and high habitat values. The project will consist of a 1.5 mile riprapped dike with water control structures, 350 islands to be excavated with marsh materials, and vegetation establishment on the dike and islands.

Benefits: In addition to the estimated benefits listed below, the project will benefit other nesting waterfowl species, shorebirds, muskrats, and many other marsh-related species.

<u>Species</u>	<u>HU's</u>
Mallard	245
Canada goose	245
Mink	140
Bald eagle - breeding	50
Total	680

Costs : Estimated implementation costs include \$471,000.00 for a riprapped dike 1.5 miles long and 10 feet high; \$12,000.00 for 3 water control structures; \$210,000.00 for 350 islands 100 feet long, 50 feet wide, and 6 feet high; and \$6,000.00 for vegetation establishment on the dike and islands. Due to erosion and marsh plant encroachment, annual operation, maintenance, and monitoring of island and open-water conditions will be necessary to sustain the benefits of this project.

Advance Design	30,000.00
Implementation	<u>699,000.00</u>
Total	\$729,000.00
Operation and Maintenance	7,000.00
Monitoring	<u>1,600.00</u>
Total Annual Costs for Life of Palisades Project	\$8,600.00

Mud Lake WMA Headquarters Bay enhancement. -- This project will convert 350 acres of intermittent marsh without water control and with relatively low-quality waterfowl and aquatic furbearer habitat into 350 acres of permanent marsh with water control and moderately high habitat values. The project will consist of a 0.5 mile riprapped dike with water control structures, 50 riprapped islands, and vegetation establishment on the dike and islands.

Benefits: In addition to the benefits listed below, the project will benefit many other nesting waterfowl species, shorebirds, and other marsh-related species.

<u>Species</u>	HU's
Mallard	249
Canada goose	249
Mink	215
Total	713

Costs: Estimated implementation costs include \$227,000.00 for a riprapped dike 0.5 miles long and 15 feet high; \$8,000.00 for 2 water control structures; \$150,000.00 for 50 riprapped islands 100 feet long, 50 feet wide, and 6 feet high; and \$1,000.00 for vegetating the dike and islands. Due to erosion and marsh plant encroachment, annual operation, maintenance, and monitoring of islands and open-water conditions will be necessary to sustain the benefits of this project.

Advance Design	30,000.00
Implementation	<u>386,000.00</u>
Total	\$416,000.00
Operation and Maintenance	8,600.00
Monitoring	<u>1,100.00</u>
Total Annual Costs for Life of Palisades Project	\$9,700.00

Mud Lake WMA East Slough enhancement. -- This project will create 200 acres of high-quality permanent marsh in a lowland area that presently receives only intermittent water and in most years provides almost no habitat values for waterfowl and aquatic furbearers. The project **will** consist of a 1.0 mile earthen dike with water control structures, 100 earthen islands, vegetation establishment on the dike and islands, and a 50 horsepower pump to provide water during drier years.

Benefits: The project will benefit **all** marsh-related species present including the target species listed below, other waterfowl, shorebirds, and muskrats. The project **will** also enhance prey in an area being used for foraging by peregrine falcons.

<u>Species</u>	<u>HU's</u>
Mallard	255
Canada goose	170
Mink	180
Yellow warbler	10
Total	615

costs: Estimated implementation costs would include \$125,000.00 for an earthen dike 1.0 mile long and 8 feet high; \$8,000.00 for 2 water control structures; \$66,000.00 for 100 islands 50 feet wide, 100 feet long, and 6 feet high; and \$2,000.00 for vegetating the dike and islands. IDFG presently has the necessary 50 h.p. pump, but the \$12,000.00 pump will need replacing about every 10 years. This annualized cost is included in operation and maintenance estimates. Other annual costs include about \$200.00 for pump maintenance, \$5,000.00 electricity for pumping, and \$6,000.00 for annual operation, maintenance, and monitoring of island and open-water conditions to sustain the benefits of this project.

Advance Design	30,000.00
Implementation	<u>195,000.00</u>
Total	\$225,000.00
Operation and Maintenance	12,400.00
Monitoring	<u>800.00</u>
Total Annual Costs for Life of Palisades Project	\$13,200.00

Grays Lake protection. -- Protect, through acquisition of easements or fee-titles from willing sellers, 1,000 acres of critical private lands on the periphery of Grays Lake. Grays Lake was designated as a National Wildlife Refuge on June 17, 1965.

Grays Lake is historically tied to the Palisades Project. In 1947, the USFWS recommended that the water in Palisades Reservoir be exchanged for Grays Lake water used on the Fort Hall Indian Reservation. This exchange would stabilize fluctuating water levels at Grays Lake, which would benefit nesting waterfowl and aquatic furbearers. Besides the water exchange, the USFWS recommended acquisition of 9,300 acres of private land and 3,500 acres of public land that would subsequently be managed for wildlife, specifically waterfowl.

When Congress reauthorized the Palisades Project in 1950, the authorizing legislation included a reservation of "...not to exceed **fifty-five** thousand acre-feet of active capacity in Palisades Reservoir for a period ending December 31, 1952, for replacement of Grays Lake storage: (Public Law 81-864). This reservation was intended to allow the USFWS time to negotiate the water exchange, and it was later extended to December 31, 1955 by the Secretary of the Interior. Without the land base necessary, the USFWS was unable to resolve riparian-landowner conflicts and develop a water exchange that was acceptable to local residents. Unable to work things out, in 1956 the USFWS recommended that the storage reserved for the exchange be released for other purposes. This water was subsequently allocated to irrigation use in December, 1958.

The long-term goal of this present project is to ultimately hold water levels higher in Grays Lake later into the year. In 1964, the USFWS and the Bureau of Indian Affairs (BIA) signed a Memorandum of Understanding (MOU), and in 1965 a Cooperative Use Agreement (CUA) was signed by the USFWS and 22 landowners on the periphery of Grays Lake. Both of the agreements called for the water level in Grays Lake to be lowered to an elevation of 6,386.3 or 0.5 feet above the lakebed by June 20 each year.

This water management schedule has left little standing water in Grays Lake by late summer, and has led to a cense stand of emergent vegetation. The low water levels have reduced the quality of waterfowl and aquatic furbearer habitat and increased depredation problems on waterfowl and sandhill crane nests. The latter affects the success of the endangered whooping crane foster parent program at the refuge.

The goals of the USFWS for Grays Lake Refuge are "contingent on acquisition or control of lands and water currently outside of those presently controlled by the USFWS" (USFWS 1982). Some lands have already been acquired by USFWS on a willing seller basis as federal funds have become available. The 1,000 acres of private lands proposed for protection in this project are about half of the total acreage owned by the remaining landowners involved with the original 99 year agreement. Protection of this 1,000 acres would augment the USFWS

ongoing acquisition program at Grays Lake and increase the likelihood of higher water levels being maintained in the future to benefit waterfowl and furbearers.

The BIA has expressed an interest in maintaining higher water levels in Grays Lake for irrigation storage. It is believed that a new water management agreement could be worked out in the future between the USFWS and the BIA (S. Sather-Blair, USFWS, pers. commun.)

Benefits: Estimated benefits from the protection of 1,000 acres of private land are displayed below. These figures do not take into account substantial long term benefits to wildlife should increased water levels become a reality. Increased water levels are expected to result in increased muskrats and muskrat houses, followed by increased waterfowl production (R. Drewien, USFWS, pers. commun.). Benefits to sandhill cranes and whooping cranes would also occur with increased water levels, due to reduced depredation problems.

<u>Species</u>	<u>HU's</u>
Mallard	700
Canada goose	900
Mink	300
Yellow warbler	9
Total	<u>1,909</u>

Costs: The protection of 1,000 acres would involve about 5 landowners and 6 parcels of private land. Protection costs are estimated to be \$548,000.00. Land values are estimated at \$500.00/acre. Annual operation, maintenance, and monitoring will be necessary to sustain annual benefits to wildlife.

Advance Design	13,000.00
Implementation	<u>548,000.00</u>
Total	\$561,000.00
Operation and Maintenance	2,000.00
Monitoring	<u>2,500.00</u>
Total Annual Costs for Life of Palisades Project	\$4,500.00

Market Lake WMA East Springs Marsh and Main Marsh enhancement. -- This project will enhance 250 acres in 2 marshes that presently are choked with cattails and provide almost no open water. The project is designed to increase open water with ditching and building one island per acre with the dredge materials. Vegetation will be planted on the islands to enhance waterfowl production.

Benefits: In addition to the target species listed below, the project will benefit all marsh species that prefer the diversity provided by a marsh having open water and islands that provide safe nesting sites.

<u>Species</u>	<u>HU's</u>
Mallard	200
Canada goose	175
Mink	75
Bald eagle - breeding	38
Total	488

Costs: Estimated implementation costs include \$150,000.00 for dredging and excavating 250 islands 100 feet long, 50 feet wide, and 6 feet high, and 33,700.00 for vegetating the islands. Due to erosion and marsh plant encroachment, annual operation, maintenance, and monitoring of island and open-water conditions will be necessary to sustain the benefits of this project.

Advance Design	30,000.00
Implementation	<u>153,700.00</u>
Total	\$183,700.00
Operation and Maintenance	5,000.00
Monitoring	<u>500.00</u>
Total Annual Costs for Life of Palisades Project	\$5,600.30

Mud Lake WMA West Slough enhancement. -- This project will create 200 acres of high-quality permanent marsh in a lowland that presently receives only intermittent water and in most years provides almost no habitat values for waterfowl and aquatic furbearers. The project will consist of a riprapped dike 1.0 mile long, water control structures, 100 earthen islands, vegetation establishment on the dike and islands, and a 50 h.p. pump and a 75 h.p. pump.

Benefits: This project will benefit all marsh-related species present including the target species listed below, other waterfowl, shorebirds and muskrats. The project will also enhance prey in an area being used for foraging by peregrine falcons.

<u>Species</u>	<u>HU's</u>
Mallard	255
Canada goose	170
Mink	180
Yellow warbler	10
Total	615

Costs: Estimated implementation costs include \$314,000.00 for a riprapped dike 1.0 mile long and 10 feet high; \$8,000.00 for 2 water control structures; 650,000 for 50 earthen islands 100 feet long, 50 feet wide, and 10 feet high; and \$1,000.00 for vegetating the dike and islands. IDFG presently has the 50 h.p. and 75 h.p. pumps, but this \$24,000.00 worth of pumps will need replacing about every 10 years. This annualized cost is included in operation and maintenance estimates. Other annual costs will include \$400.00 for pump maintenance, \$6,000.00 electricity for pumping, and \$6,000.00 for annual operation, maintenance, and monitoring of island and open-water conditions to sustain the benefits of this project.

Advance Design	30,000.00
Implementation	<u>373,000.00</u>
Total	8403,000 .00
Operation and Maintenance	14,800.00
Monitoring	<u>800.00</u>
Total Annual Costs for Life of Palisades Project	\$15,600.00

PREFERRED PROTECTION/ENHANCEMENT PROJECTS (Wyoming)

The following project was developed by WDFW personnel as partial mitigation for waterfowl and furbearer losses in Wyoming from inundation caused by the construction of Palisades Reservoir.

Alpine wetland enhancement. -- This project will occur on about 250 acres of land administered by the USFS (above high-water line) and the USBR (below high-water line). The current project proposal consists of an impoundment within the high-water line of Palisades Reservoir and shallow ditching above the high-water line. The project will result in development and improvement of 60 to 80 acres of permanent, shallow water wetlands, all within Wyoming.

Currently, this project has the support of local landowners and the citizenry of Alpine, Wyoming. Support for this wetland has been strong for some time now, and there is an indication that landowners adjacent to the proposed project area may be willing to participate in an easement/purchase/exchange program to allow for additional wetland acres in the future.

At the current time, a mosquito abatement program is being implemented in the area through a joint agency and citizen effort. Discussion of the wetland project plans with the Alpine Recreation Development Association and the Lincoln County Pest Control indicate that the design of the project may inhibit mosquito production by converting seasonally flooded areas to permanently flooded areas, and by decreasing water fluctuations in the spring and summer. Close coordination with pest control personnel will continue through the planning phase so the wetland is designed with mosquito breeding habitat in mind.

Benefits: The target species to benefit from this project include mallard, Canada goose, mink, and bald eagle. A host of other waterfowl species will also benefit from this project including gadwall, American wigeon, cinnamon teal, green-winged teal, Northern shoveler, ruddy duck, and redhead. Nongame species that **will** benefit include the sandhill crane, great blue heron, and other wetland dependent birds. The area will provide both consumptive and nonconsumptive wildlife values.

<u>Species</u>	<u>HU's</u>
Mallard	127
Canada goose	132
Mink	34
Bald eagle - breeding	<u>32</u>
Total	325

Costs: Advance design will include all costs associated with surveying for the impoundment dike, contour survey and

layout/design of excavated wetland ponds and channels, survey for island location and design, and time for permit applications. Implementation costs will include dike and island construction for the shallow water impoundment, construction of 6 low-level channel dikes, and excavation of existing channels and drainage ways above the high-water line. Materials from the excavation work will be used for the construction of the dikes and islands. Costs for the shallow water impoundment dike further broken down include the transportation of 42,000 cubic yards of dike material (\$231,000.00 water level control structure (\$3,500.00), and vegetation establishment on the dike (\$3,000.00). Two islands 350 feet by 20 feet and 1 island 175 feet by 20 feet will be built in the shallow water impoundment at a total cost of \$50,600.00

Costs for work in the wetland above the high-water line include excavation with dozer and dragline (\$30,000.00), construction of low level dike (\$10,000.00), and water control structures (\$8,000.00).

Operation and maintenance is estimated to cost \$4,000.00 annually and will include inspection and repair of structure damage caused by wave action, muskrat burrowing, and natural deterioration. Time will also be required to check and manipulate desired water levels for ensured aquatic plant and invertebrate production. Monitoring (\$1,000.00/year) of target species response to the impoundment will be required to assure that desired mitigation results are being obtained.

Advance Design	30,000.00
Implementation	<u>366,100.00</u>
Total	\$366,100.00
Operation and Maintenance	4,000.00
Monitoring	<u>1,000.00</u>
Total Annual Costs for Life of Palisades Project	\$5,000.00

Table 8. Summary of waterfowl and aquatic furbearer preferred protection/enhancement projects. The objective of these projects is to protect and/or improve important riparian habitat. In order to sustain annual benefits, annual operation, maintenance, and monitoring will be necessary throughout the life of the Palisades Project.

Waterfowl and Aquatic Furbearer Preferred Projects	costs		Waterfowl and Aquatic Furbearer Benefits (HU's)
	Advance Design & Implementation	Annual O&M & Monitoring	
<u>Idaho</u>			
Market Lake WMA Triangle Marsh enhancement	729,000	8,600	630
Mud Lake WMA Headquarters Bay enhancement	416,000	9,700	713
Mud Lake WMA East Slough enhancement	225,000	13,200	605
Grays Lake protection (1,000 ac)	561,000	4,500	1,900
Market Lake WMA East Springs and Main Marsh enhancement	183,700	5,600	450
Mud Lake WMA West Slough enhancement	403,000	15,600	505
<u>Wyoming</u>			
Alpine wetland enhancement	<u>366,100</u>	<u>5,300</u>	<u>293</u>
Subtotals	\$2,883,800	362,200	5,196
<u>Other Species Preferred Projects (Idaho)</u>			
South Fork Snake River protection/enhancement (3,200 ac)			721
Henrys Fork Snake River protection/enhancement (535 ac)			656

Table 8. Continued.

Waterfowl and Aquatic Furbearer Preferred Projects	costs		Waterfowl and Aquatic Furbearer Benefits (HU's)
	Advance Design & Implementation	Annual O&M & Monitoring	
South Fork Snake River protection/enhancement (additional 2,000 ac) ⁵			<u>451</u>
Total			7,024
Palisades Project Impacts (HU's)			-5,703

⁵ Benefits for species other than bald eagle and nongame/riparian species are trade-offs for wintering bald eagle losses that cannot be mitigated in the general vicinity of Palisades Reservoir.

UPLAND GAME

RUFFED GROUSE

Biological Needs

Ruffed grouse inhabit early successional deciduous communities and prefer sites dominated by quaking aspen (Populus tremuloides) (Berner and Gysel 1969). Gullian (1970) considered the presence of aspen to be critical in maintaining viable ruffed grouse populations in Minnesota. In the Pacific Northwest, ruffed grouse are typically found in lowlands and river bottoms, in ecotones between forests and clearings, and in brush tang les In burned or logged areas (Jackman and Scott 1975). In Idaho, they also use aspen stands year-round (Stauffer and Peterson 1985).

The ruffed grouse diet consists primarily of plant matter. Aspen and cottonwoods were listed as the principal foods in 17 different studies (Korschgen 1966). Winter foods consist largely of buds and twigs of trees. Aspen was the most important winter food source in Minnesota (Gullian 1967).

Existing Managemtn Goals

A goal of the Targhee National Forest (TNF) is to treat a minimum of 1,140 acres of aspen each year for wildlife habitat improvement. An objective of the TNF is to manage aspen primarily for wildlife habitat, and secondly for timber, firewood products, and livestock forage. A standard of aspen management for forest grouse in the TNF should be to manage for 4 age classes within a 20 to 40 acre stand with optimum size blocks for each age class of 2.5 acres (TNF 1985).

Idaho Fish and Game goals for forest grouse are to protect and enhance habitat whenever possible and to increase populations and distribution (Rybarczyk et al. 1985).

Protection/Enhancement Goals

It was estimated that the construction of Palisades Reservoir and subsequent hydroelectric development resulted in a loss of 2,331 ruffed grouse HU's (Sather-Blair and Preston 1985). These losses were associated with aspen and riparian habitats. The work group agreed that a reasonable goal for protection/enhancement of the ruffed grouse is to replace at least those HUs lost while considering the needs of ruffed grouse in the general area of Palisades Reservoir

Preferred Protection/Enhancement Projects (Wyoming)

The following ruffed grouse project was developed by WDGf personnel as partial mitigation for wildlife habitat losses in Wyoming caused by construction of Palisades Reservoir. The interagency work group agreed that Wyoming should be the site of the majority of ruffed grouse enhancement work, due to the critical need for aspen management in western Wyoming. Ruffed grouse also benefit from other preferred projects (Table 9) detailed in the bald eagle section.

Greys River District aspen project. -- This project will treat 4,928 acres of aspen and associated vegetation types on the Greys and Salt River drainages in Wyoming using prescribed burning and mechanical treatments for the purpose of regenerating aspen. Early successional stages of aspen are important components of ruffed grouse habitat.

This project will take place on Bridger-Teton National Forest lands and WDGf lands. The management of aspen on these areas has reached a critical point. The lack of natural and man-caused disturbances has resulted in advanced age aspen stands with little regeneration. This condition has negatively impacted **wildlife** species that are associated with the early successional stages of aspen (Bridger-Teton National Forest 1983).

Benefits: Because of their close association with early successional stages of aspen, this project will benefit ruffed grouse in addition to a variety of other wildlife, including moose.

<u>Species</u>	<u>HU's</u>
Ruffed grouse	986

Costs: Advance design work will include site specific evaluations and prescriptions and the preparation of environmental assessments. Implementation of aspen treatments will take place over a period of 10 years with approximately 490 acres treated each year. Annual operation and maintenance will be required to assure that stands are maintained in early successional stages. Sites will be monitored annually to determine aspen and ruffed grouse responses to treatments and to adapt habitat management as needed,

Advance Design	22,500.00
Implementation	<u>66,900.00</u>
Total	\$89,400.00
Operation and Maintenance	6,700.00,
Monitoring	<u>2,500.00</u>
Total Annual Costs for Life of Palisades Project	\$9,200.00

Table 9. Summary of ruffed grouse preferred protection/enhancement projects. The objective of these projects is to protect and/or improve important aspen and cottonwood habitat. In order to sustain annual benefits, annual operation, maintenance, and monitoring will be necessary throughout the life of the Palisades Project.

Preferred Projects	Costs		Ruffed Grouse Benefits (HU's)
	Advance Design & Implementation	Annual O&M & Monitoring	
<u>Wyoming</u>			
Grays River District aspen enhancement	\$89,400	\$9,200	986
<u>Other Species Preferred Projects (Idaho)</u>			
South Fork Snake River protection/enhancement (3,200 ac)			1,362
South Fork Snake River protection/enhancement (additional 2,000 ac) ⁶			<u>851</u>
Total			3,199
Palisades Project Impacts (HU's)			-2,331

⁶ Benefits for species other than bald eagle and nongame/riparian species are trade-offs for wintering bald eagle losses that cannot be mitigated in the general vicinity of Palisades Reservoir.

OTHER

PEREGRINE FALCON

Biological Needs

The peregrine falcon is presently listed as endangered in the United States under the Endangered Species Act of 1973 (as amended). Severe population declines were identified in the early 1960's, with peregrines essentially extirpated from the northern Rocky Mountain states by 1975 (Heinrich et al. 1986). It has been suggested that the demise of the peregrine could be traced to a loss of habitat (wetlands and associated prey base), which resulted from a change in climate, and the widespread use of DDT and its metabolites, which prevented reproduction from occurring (USFWS 1984b).

Peregrines in the Rocky Mountains nest mainly on mountain cliffs and river gorges. Nest sites are often adjacent to water courses and impoundments because of the abundance of avian prey that frequent such areas.

Peregrines may travel up to 17 miles from nesting cliffs to hunting areas (Porter and White 1973). Habitats such as river bottoms, marshes, meadows, and lakes attract numerous small birds and provide preferred hunting areas for peregrines.

Existing Management Goals

Under the American peregrine falcon recovery plan (USFWS 1984b), the statewide recovery objective for Idaho is 17 pairs. An objective of a recently submitted cooperative proposal (Heinrich et al. 1986) is to establish and maintain 30 nesting pairs of peregrine falcons in the tri-state area (Idaho, Montana, and Wyoming) by 1990. The objective for Idaho under this proposal is the establishment of 10 nesting pairs. The proposal states: "By concentrating limited resources and first obtaining objectives for the tri-state recovery zone, states should be able to maximize results and efficiently expand efforts to statewide recovery objectives in 1990-1995."

In compliance with the Endangered Species Act of 1973 (as amended), the Targhee National Forest seeks to conserve habitat necessary for the protection and recovery of the American peregrine falcon (TNF 1980).

The IDFG will attempt to re-establish extirpated native species to portions of their former range (Morache et al. 1985). The Department will continue to cooperate with USFWS, BLM, USFS, private industry, and the Peregrine Fund in backing programs to reintroduce breeding peregrines into suitable locations in Idaho.

Protection/Enhancement Goals

The level of impacts that construction of Palisades Reservoir had on peregrine falcons is hard to quantify. The peregrine falcon was **originally** found in the vicinity of Palisades Reservoir (Sather-Blair and Preston 1985). However, the Palisades Wildlife Impact Assessment did not quantify impacts.

It has been suggested that a **significant** cause of the falcon's historic decline can be attributed to loss of wetlands and associated prey items, which could have been a combined effect resulting from change in precipitation levels and hydroelectric development (Nelson, pers. commun., in Bunham and Howard 1986). Although some reservoirs provide important migratory and wintering habitat for birds, there has been a net loss of quality breeding habitat for birds in the form of riparian plant communities (Howerton et al. 1984, Martin et al. 1985). At Palisades Reservoir alone, 2,509 acres of forested wetlands and scrub-shrub wetlands were inundated and lost (Sather-Blair and Preston 1985).

Because peregrine falcons have reached such low numbers in the northern Rocky Mountain states, it takes more than just improved habitat to recover the population. A large scale captive propagation and release program for peregrines has been underway since 1970. This program is conducted by the Peregrine Fund, a non-profit organization. Because habitat has changed, the release of peregrines cannot simply be accomplished by reintroduction at historic locations associated with **particular** hydroelectric projects. Instead, those release locations that offer the greatest biological potential should be used regardless of which agency controls the land.

A concentrated reintroduction effort is currently proposed for adjacent areas of northwestern Wyoming, eastern Idaho, and southern Montana (Heinrich et al. 1986). This concentrated reintroduction effort is intended to encourage interaction among potential breeders and maximize opportunities to establish a viable breeding population. The tri-state area is one of the few areas where a large contingency of suitable nesting habitat exists. One pair of peregrine falcons is known to nest in eastern Idaho at this time,

In light of the cooperative proposal for reintroductions of peregrines in the tri-state area (Heinrich et al. 1986), and the critical needs of this endangered species, a reasonable level of protection/enhancement would be the establishment and maintenance of 3 hacking (reintroduction) sites near Palisades Reservoir for at least 10 years. The 3 hack boxes would be used to stock peregrines at the rate of 3 to 5 birds per box per year.

Preferred Protection/Enhancement Projects (Idaho)

The following projects were specifically designed to benefit peregrine falcons in the vicinity of Palisades Reservoir (Table 10).

Peregrine falcon reintroductions - Palisades Reservoir. -- The goal of this project is to release 3 to 5 peregrines annually from each of 2 hack sites for at least 10 years. After 10 years of releases, success of the project will be evaluated to assess whether further releases are needed. Only one new hack site will need to be prepared because a hack box is already in place at Palisades Creek. The proposed location for the second hack site is yet to be determined.

Costs: Advance design costs include a survey to find a suitable location for the second hack site and development of a management plan. Implementation costs are estimated to be \$17,500.00/site/year and include the propagation and release of birds. Monitoring costs include annual surveys to locate active nests and signs of productivity, and an evaluation of release sites and methods.

Advance Design	2,500.00
Implementation	<u>350,000.00</u>
Total	\$352,500.00
Operation and Maintenance	400.00
Monitoring (\$4,000.00/site/year)	<u>8,000.00</u>
Total Annual Costs	\$8,400.00

Preferred Protection/Enhancement Projects (Wyoming)

Peregrine falcon reintroductions - Phillips Canyon. -- The goal of this project is to annually release 3 to 5 peregrines at the Phillips Canyon release site near Wilson, Wyoming for at least 10 years. After 10 years of releases, success of the project **will** be evaluated to assess whether further releases are needed. The release site is already established. This project **will** be part of a coordinated effort to re-establish a nesting population in the **tri-state** area of Wyoming, Idaho, and Montana.

Costs: Advance design costs include development of a management plan. Implementation costs are estimated to be \$17,500.00/year, and include the propagation and release of birds. Monitoring costs include annual surveys to locate active nests and signs of productivity, and an evaluation of the release site and methods.

Advance Design	1,000.00
implementation	<u>175,000.00</u>
Total	\$176,000.00
Operation and Maintenance	200.00
Monitoring (\$4,000.00/site/year)	<u>4,000.00</u>
Total Annual Costs	\$4,200.00

Table 10. Summary of peregrine falcon preferred projects. The objective of these projects is to reintroduce peregrines at sites where they historically occurred and that presently provide the greatest biological potential for the endangered peregrine's re-establishment. Annual operation, maintenance, and monitoring will be required for at least 10 years to ensure the successful propagation and release of birds.

Preferred Projects	Costs		Benefits
	Advance Design & Implementation	Annual o&m & Monitoring	Annual Release of Peregrines
<u>Idaho</u>			
Peregrine falcon reintroductions Palisades Reservoir	352,500	8,400	6-10 birds
<u>Wyoming</u>			
Peregrine falcon reintroductions Phillips Canyon	<u>176,000</u>	<u>4,200</u>	<u>3- 5 birds</u>
Totals	\$528,500	\$12,600	9-15 birds

PALISADES PREFERRED MITIGATION PLAN SUMMARY

The Interagency work group agreed that a reasonable mitigation goal for wildlife impacts from the Palisades Project is to protect and/or enhance enough wildlife habitat to replace the value of habitat inundated by the Project. The Interagency work group further agreed to use the target species Habitat Units (HU's) lost as a guideline during the mitigation planning process, while carefully considering the needs of wildlife in the area.

After examining a number of mitigation projects developed by resource agency personnel in both Idaho and Wyoming, the work group has developed a preferred mitigation plan (Table 11) that follows the mitigation goals outlined at the beginning of this planning process. Estimated benefits from the preferred projects are presented in Table 12, and estimated initial 10-year costs are outlined in Table 13. Projects were prioritized by the Interagency work group based on mitigation goals and needs of wildlife in the area. Many bald eagle winter Habitat Units were lost when the Palisades Project area was inundated. The work group agreed that because many of these losses could not be mitigated in the upper Snake River area, HU's for other target species should be used as trade-offs. Personnel from Idaho and Wyoming worked closely within the Interagency work group to develop a preferred mitigation plan that serves the special needs of wildlife in each respective state. The preferred mitigation plan for each state should be treated separately.

All proposed acquisitions of easements or fee-titles in the preferred mitigation plan meet the land acquisition criteria outlined in the Columbia River Basin Fish and Wildlife Program and the Northwest Power Act. All projects complement management policies and goals of federal and state wildlife agencies and the Shoshone-Bannock Tribes. Acquisition projects were developed by professional wildlife biologists and wildlife land managers who took into consideration the needs of wildlife in the area, the cost-effectiveness of acquisition projects compared to available alternatives, and the biological objectives of the mitigation plan. Acquisitions are consistent with Shoshone-Bannock legal rights. To our knowledge, they are not proposed for being funded by the BPA fund in lieu of any other expenditures presently authorized or required from other entities under other agreements or provisions of law.

Annual operation, maintenance, and monitoring of mitigation projects will be necessary for the life of Palisades Project for this Plan to protect, mitigate, and enhance wildlife to the extent affected by hydroelectric development and operation. Continued annual funding is justified by the fact that as long as the project is in place, the identified wildlife habitat impacts will continue to occur. The Palisades Project inundated naturally self-perpetuating ecosystems. This Plan is to mitigate those losses through man-made enhancements, which are not naturally self-perpetuating. Mitigation for these impacts is contingent upon hands-on management actions at all enhancement projects. Under the methods in this Plan, mitigation

cred it for enhancement is the difference between the habitat values, presently provided and the habitat values provided with hands-on management (habitat treatments followed by operation and maintenance). If annual operation, maintenance, and monitoring of enhancement actions cease being funded, management actions will cease, and the projects will no longer provide the full benefits estimated in this Plan. As a result, the benefits of mitigation projects would have to be re-evaluated, and more acquisitions of fee-titles or easements would be needed to mitigate Palisades Project's wildlife losses. Because annual wildlife losses will continue for the life of Palisades Project, annual benefits of enhancement projects must be sustained by hydropower beneficiaries for this Plan to mitigate wildlife impacts to the extent affected by hydropower.

It appears that establishing an interest-yielding trust fund would be the most cost-effective way to fund annual operation, maintenance, and monitoring. This potential funding method needs to be refined by economists. It does appear that it would reduce the overall cost of the plan to ratepayers.

In addition to the preferred projects presented in Tables 12 and 13, the interagency work group has developed a number of alternatives that address the needs of wildlife in the area. These alternatives are discussed in the next section. If circumstances should dictate that a project in the preferred mitigation plan is not feasible, the work group feels that alternatives should be added to the preferred plan until the loss of the preferred project (in terms of target species HU's has been compensated for. The interagency work group looks forward to continued coordination with the Northwest Power Planning Council and the Bonneville Power Administration.

Table 11. Palisades Project wildlife protection, mitigation, and enhancement plan summary. Preferred projects detailed in this mitigation plan should be used as operational guidelines as the plan is approved and implemented.

Target Species	Habitat Losses Attributable to Hydropower	Mitigation Goals
Bald eagle Nongame/ Riparian species (Yellow warbler, Black-capped chickadee)	5,941 breeding bald eagle HU's; 18,565 wintering bald eagle HU's; 716 HU's for scrub-shrub wetland dependent species; 1,358 HU's for forested wetland dependent species	Protect and enhance 5,825 acres of key riparian habitat in eastern Idaho, preferably in the South Fork and Henrys Fork Snake River areas. In addition, existing and potential bald eagle nest sites in eastern Idaho and existing nest sites in western Wyoming will be enhanced and maintained. Bald eagle winter habitat will be enhanced with the construction of 30 artificial and natural perch sites. This total preferred plan will result in an estimated gain of 5,903 breeding bald eagle HU's, 6,393 wintering bald eagle HU's, 550 HU's for scrub-shrub wetland dependent species, and 1,866 HU's for forested wetland dependent species. An additional 120 breeding bald eagle HUs and 29 HU's for scrub-shrub wetland dependent species will be gained through enhancement at other preferred projects that are primarily for waterfowl and aquatic furbearers. Years 1 ⁷ -3, advance design. Years 2-6, implementation. Years 3 through life of Palisades Project, annual operation, maintenance, and monitoring.
Elk/Mule Deer	2,454 HU's	Protect and enhance 13,790 acres of key winter range in eastern Idaho, preferably in Sand Creek or Swan Valley areas. This project is estimated to result in gains of

⁷ Possible start-up date is the latter part of federal fiscal year 1987. "Year 1" in this schedule ends at the end of federal fiscal year 1988.

Table 11. Continued.

Target Species	Habitat Losses Attributable to Hydropower	Mitigation Goals
Waterfowl and Aquatic Furbearers	5,703 HU's	<p>10,957 big game Hu's. An additional 945 big game Hu's will be gained through enhancement in conjunction with preferred projects that are primarily for bald eagles and nongame/riparian species. The gains of 6,957 of these Hu's are a trade-off for wintering bald eagle losses that cannot be mitigated in the general vicinity of the Palisades Project. Years 1-3, advance design. Years 2-7, implementation. Year 3 through life of Palisades Project, annual operation, maintenance, and monitoring.</p> <p>To provide a gain of 4,903 Hu's, protect and/or enhance waterfowl and aquatic furbearer habitat in eastern Idaho, preferably through the following actions: enhance Market Lake and Mud Lake wildlife Management Areas to provide an additional 3,003 waterfowl and aquatic furbearer HU's; protect 1,000 acres in Grays Lake area to gain 1,900 waterfowl and aquatic furbearer Hu's. Enhance habitat in Wyoming to gain 293 waterfowl and aquatic furbearer Hu's, preferably by developing a wetland complex at the upper end of Palisades Reservoir by Alpine. An additional 1,828 waterfowl and aquatic furbearer HU's will be gained through enhancement actions in conjunction with preferred projects listed under bald eagles and nongame/riparina species. Years 1-3, advance design. Years 2-6, implementation. Year 3</p>

Table 11. Continued.

Target Species	Habitat Losses Attributable to Hydropower	Mitigation Goals
Ruffed Grouse	2,331 HU's	<p>through life of Palisades Project, annual operation, maintenance, and monitoring.</p> <p>Enhance 4,928 acres of aspen and associated vegetation types preferably in western Wyoming, using prescribed burning and mechanical treatments in the Greys and Salt River drainages. This project will result in an estimated gain of 986 ruffed grouse HU's. An additional 2,213 ruffed grouse HU's will be gained through preferred projects listed under bald eagle and nongame/riparian species that will result in the protection and enhancement of key riparian habitat. Year 1, advance design. Years 2-11, implementation. Year 3 through life of Palisades Project, annual operation, maintenance, and monitoring.</p>
Peregrine Falcon	1,677 acres of forested wetland and 832 acres of scrub-shrub wetland	<p>Establish and maintain 3 hacking (reintroduction) sites near Palisades Reservoir for at least 10 years. Preferably, two of the sites will be in Idaho, and one site will be in Wyoming. Peregrines will annually be stocked at the rate of 3 to 5 birds per site. Year 1, advance design. Year 2 to at least year 11, annual implementation, operation, maintenance, and monitoring.</p>

Table 12 continued

Project	Target Species									Total
	Bald Eagle Breeding	Bald Eagle Winter	Elk/ Mule Deer	Mallard	Canada Goose	Mink	Black- capped Warbler	Chickadee	Ruffed Grouse	
Peregrine falcon reIntroductions, Pallisades Reservoir										
South Fork Snake River protection/ enhancement (additional 2,000 ac) ⁸	1,329	2,000	356	144	116	191	106	678	851	5,771
Sand Creek protection/enhancement (additional 8,040 ac) ⁹			6,432							6,432
Swan Valley protection/enhancement (750 ac) ⁹			525							525
Subtotal	5,591	6,393	11,902	2,539	2,215	1,977	579	1,866	2,213	35,275
<u>Wyoming</u>										
Alpine wetland enhancement	32			127	132	34				325
Greys River District aspen enhancement									986	986
Peregrine falcon reIntroductions Phillips Canyon										
Bald eagle nest sites enhancement	480									480
Subtotal	512			127	132	34			986	1,791
Total (Idaho and Wyoming)	6,103	6,393	11,902	2,666	2,347	2,011	579	1,866	3,199	37,066

⁸ Benefits for species other than bald eagle and nongame/riparian species are trade-offs for wintering bald eagle losses that cannot be mitigated in the general vicinity of the Pallisades Project.

⁹ Trade-off for wintering bald eagle losses that cannot be mitigated in the general vicinity of the Pallisades Project.

Table 13. Estimated initial 10 year costs of the preferred mitigation plan. After the initial 10 years, annual operation, maintenance, and monitoring will continue to be necessary to sustain project benefits. For each respective state, projects are listed in order of priorities chosen by the Interagency work group. The preferred mitigation plan from each state should be considered separately.

Project	Annual Costs				Total Initial 10 Year Costs
	Advance Design	Implementation	Operation and Maintenance	Monitoring	
<u>Idaho</u>					
South Fork Snake River protection/enhancement (3,200 ac)	100,000	2,776,000	64,000	8,000	3,380,000
Sand Creek protection/enhancement (5,000 ac)	25,000	683,000	10,000	5,000	813,000
Market Lake WMA Triangle Marsh enhancement	30,000	699,000	7,000	1,600	789,200
Mud Lake WMA Headquarters Bay enhancement	30,000	386,000	8,600	1,100	483,900
Mud Lake WMA East Slough enhancement	30,000	195,000	12,400	800	317,400
Grays Lake protection (1,000 ac)	13,000	548,000	2,000	2,500	592,500
Market Lake WMA East Springs and Main Marsh enhancement	30,000	153,700	5,000	600	222,900
Mud Lake WMA West Slough enhancement	30,000	373,000	14,800	800	512,200
Henrys Fork Snake River protection/ enhancement (535 ac)	10,000	240,700	3,000	1,000	278,700
Palisades Reservoir bald eagle nesting territory protection (90 ac)	15,000	458,000	1,000	1,000	487,000
Bald eagle nest sites enhancement	10,000	44,000	4,000	1,200	90,400
Mud Lake and Market Lake WMA's winter bald eagle perches	3,000	18,500	1,000	1,000	35,500

Project	Annual Costs				Total Initial 10 Year Costs
	Advance Design	Implementation	Operation and Maintenance	Monitoring	
Peregrine falcon reintroductions (2 hack sites)	2,500	315,000	400	8,000	393,100
South Fork Snake River protection/ enhancement (additional 2,000 ac)	62,500	1,735,000	40,000	5,000	2,112,500
Sand Creek protection/enhancement (additional 8,040 ac)	87,500	3,275,000	79,000	6,000	3,957,500
Swan Valley protection/enhancement (750 ac)	20,000	294,000	8,000	1,500	380,500
Subtotal	\$498,500	\$12,193,900	\$260,200	\$45,100	\$14,846,300
<u>Wyoming</u>					
Alpine wetland enhancement	30,000	336,100	4,000	1,000	401,100
Greys River District aspen enhancement	22,500	66,900	6,700	2,500	153,800
Peregrine falcon reintroductions Phillips Canyon	1,000	157,500	200	4,000	196,300
Bald eagle nest sites enhancement	40,000	16,000	2,000	1,200	78,400
Subtotal	\$93,500	\$576,500	\$12,900	\$8,700	\$829,600
Total (Idaho and Wyoming)	\$592,000	\$12,770,400	\$273,100	\$53,800	\$15,675,900

Table 14 initial 5-year action plan for Palisades Project wildlife protection, mitigation, and enhancement plan.

Federal Fiscal Year	Action
1987-88 ¹⁰	Advance design for bald eagle and nongame/riparian, elk/mule deer, waterfowl and aquatic furbearer, ruffed grouse, and peregrine falcon projects.
1989	Continue advance design for bald eagle and nongame/riparian, elk/mule deer, and waterfowl and aquatic furbearer projects; begin implementation of bald eagle and nongame/riparian, elk/mule deer, waterfowl and aquatic furbearer, ruffed grouse, and peregrine falcon projects.
1990	Continue advance design for bald eagle and nongame/riparian, elk/mule deer, and waterfowl and aquatic furbearer projects; continue implementation of bald eagle and nongame/riparian, elk/mule deer, waterfowl and aquatic furbearer, ruffed grouse, and peregrine falcon projects; and begin operation, maintenance, and monitoring of bald eagle and nongame/riparian, elk/mule deer, waterfowl and aquatic furbearer, ruffed grouse, and peregrine falcon projects.
1991, 1992	Continue implementation, operation maintenance, and monitoring of bald eagle and nongame/riparian, elk/mule deer, waterfowl and aquatic furbearer, ruffed grouse, and peregrine falcon projects.

¹⁰ Possible start-up date is the latter part of federal fiscal year 1987. "Year 1" in this schedule ends at the end of federal fiscal year 1988.

ALTERNATIVE MITIGATION PROJECTS

BALD EAGLE

Potential bald eagle nesting territory protection. -- Protect, through acquisition of easements or **fee-titles** If the seller is willing, a 7 to 9 acre parcel of private land within a high probability recovery site for future bald eagle nesting. The private parcel is near Sulfur Bar Creek at Palisades Reservoir.

Benefits: The area is in private ownership and could be logged or developed. It currently contains suitable bald eagle nesting habitat. Potential long-term benefits to bald eagles will occur if a pair occupies this territory in the future, but will be lost if the area is logged or developed.

<u>Species</u>	<u>HU's</u>
Bald eagle - breeding	5

Costs: The major estimated cost of this project will be the protection of the land. Three man days of annual monitoring will be necessary. Annual operation and maintenance will be necessary to maintain habitat quality.

Advance Design	5,000.00
implementation	35,000.00
Total	\$40,000.00
Operation and Maintenance	500.00
Monitoring	500.00
Total Annual Costs	\$1,000.00

BIG GAME

The following alternative projects are listed in order of the priority assigned by the interagency work group.

Swan Valley protection/enhancement. -- The purpose of this project is to protect through acquisition of easements or fee-titles from willing sellers, and enhance, 2,000 acres of elk and mule deer winter range near Swan Valley Idaho. The parcels have a mix of agricultural lands and native range. These private parcels lie in an area of historic deer and elk winter range. Much of the historic native winter range has been converted to agricultural production. Most of the current native range is overgrazed both by livestock and big game. As native winter range has disappeared, conflicts between wintering big game and private landowners have increased.

Benefits: Protection and enhancement of these key private parcels will help increase the quality and quantity of winter range habitat for big game in the area and reduce big game depredation conflicts.

<u>Species</u>	<u>HU's</u>
Elk/Mule deer	1,400

Costs: Protection costs are estimated to be \$595,000. Based on a combination of browse plantings on native range and agricultural land conversion, wildlife forage enhancement costs are estimated at \$100.0/acre. Annual operation, maintenance, enhancement, and monitoring will be necessary to maintain the benefits of range improvements. Monitoring will be necessary to assess the benefits of the project and to practice adaptive habitat management.

Advance Design	30,000.00
Implementation	<u>795,000.00</u>
Total	\$825,000.00
Operation and Maintenance	18,500.00
Monitoring	<u>4,000.00</u>
Total Annual Costs for Life of Palisades Project	\$22,500.00

Market Lake big game enhancement. -- This project entails planting shrub seeds and seedlings, legumes, and/or grasses on 750 acres of big game winter range, of which 200 acres would be sprinkler irrigated for a haying operation.

Benefits: This is estimated to considerably enhance elk, mule deer, and pronghorn winter forage. The Market Lake area is the southernmost (lowest elevation) portion of the critical winter range for the Sand Creek elk herd, and during severe winters it is very important.

<u>Species</u>	<u>HU's</u>
Elk/Mule deer	425

Costs: Estimated implementation costs include \$75,000 for plant establishment and \$275,000 for the sprinkler system and associated well, pump, and electrical system. Annual operation, maintenance, and monitoring will be necessary to maintain the desired winter forage conditions through sprinkler irrigation, and to cut and bale hay for maximizing habitat values for big game.

Advance Design	25,000
implementation	<u>350,000</u>
Total	\$375,000
Operation and Maintenance	41,000
Monitoring	<u>6,000</u>
Total Annual Costs	\$47,000

Tex Creek WMA § Ritter Bench big game enhancement. —The Ritter Bench area contains 560 acres of agricultural land adjacent to winter range on the Tex Creek WMA. Soil erosion is presently a problem on the cultivated land, which is owned by the Nature Conservancy but managed by the IDFG. In cooperation with the Soil Conservation Service (SCS), the area would be developed for wintering mule deer, elk, sharp-tailed grouse, and sage grouse.

The existing hardpan will be ripped and a series of 300-foot lowhead terraces built in compliance with SCS goals for the area. Browse species (shrubs) will be planted on each terrace with permanent grass strips in between.

Benef Its: This project will benefit mule deer and elk by increasing the availabiltiy of winter browse and forage. fit will also provide winter cover for sharp-tailed grouse and provide food and cover for other upland game species and a variety of nongame species.

<u>Species</u>	<u>HUs</u>
Mu le deer	560

Costs: Estimated management actions, including deep-ripping hardpan, terrace construction, and shrub and grass planting wil l cost about \$250.00/acre Advance design will include the preparation of a detailed plan for the area.

Annual operation and maintenance will be necessary to maintain the area in high qual ity habitat. Using the principle of adaptive management, the site will be monitored annually with treatment changes made accord i ng l y.

Advance Des gn implementation	7,500.00 <u>110,000.00</u>
Total	\$117,500.00
Operat Ion and Maintenance Mon i tor ng	5,000.00 <u>1,000.00</u>
Total Annual Costs for Life of Palisades Project	\$6,000.00

Tex Creek WMA big game enhancement. -- The purpose of **this** project is to **rehabilitate** 1,000 acres of big game winter range on the Tex Creek WMA Preferred browse species are now lacking on much of the winter range, due to past overgrazing. One hundred acres of **bitterbrush** would be planted annually for 10 years. Seeding rate will be 2,000 plants per acre. Each 100 acre **site** will be enclosed with 2.5 miles of high tensile **electric** fence to prevent overbrowsing and ensure **bitterbrush** seedling survival 0

Benefits: This project will benefit mule deer and elk by increasing the **avallabililty** of high quality winter browse.

<u>Species</u>	HU's
Elk/Mule deer	700

costs: Bitterbrush plants cost about \$0.17 apiece. Because of the rough terrain, planting will be done by hand at the rate of 3 man days per acre. Each 100 acre planting site will be enclosed by 2.5 miles of fence. Advance design will include the site evaluations and prescrlptlon. Annual operation and maintenance will be necessary to maintain fences and keep planting in a vigorous state. **Monitoring** planting sites annually to ensure desired benefits are being obtained will be necessary.

Advance Design	7,500.00
Implementatlon	<u>630,000.00</u>
Total	\$637,500.00
Operation and Maintenance	20,000.00
Monitoring	<u>2,000.00</u>
Total Annual Costs for Life of Palisades Project	\$22,000.00

South Fork Snake River big game enhancement. -- This consists of 10 burning and/or mahogany pruning projects on lands administered by the USFS. The projects are generally from one to six miles from the South Fork.

Benefits: These projects are to improve forage conditions on 2,970 acres of mule deer range used primarily from fall to early winter and late winter to early spring and to a lesser degree during mid-winter. Other species benefited include ruffed grouse, elk, and moose,

<u>Species</u>	HU's
Elk/Mule deer	297
Ruffed grouse	273
Total	570

costs: Estimated advance design costs include \$25,000.00 for environmental assessments, project plans, and prescribed fire plans. Estimated Implementation costs include \$91,000.00 for burning and/or pruning. Estimated operation and maintenance costs include \$7,000.00 annually for coordination, protection measures such as fences, and continuing habitat maintenance measures to sustain the benefits of the projects. A monitoring estimate of \$1,000.00 annually includes costs of transects and range follow-up studies to assess whether the treatments result in providing the benefits estimated.

Advance Design	20,000.00
Implementation	<u>91,000.00</u>
Total	\$111,000.00
Operation and Maintenance	7,000.00
Monitoring	<u>1,000.00</u>
Total Annual Costs for Life of Palisades Project	\$8,000.00

Tex Creek WMA big game protection/enhancement. -- Protect through acquisition of easements or fee-titles from willing sellers, and enhance, about 2,846 acres of mule deer and elk winter range adjacent to the IDFG Tex Creek WMA in eastern Idaho. A total of 790 acres are currently in agricultural production. The majority of these parcels are located directly between key deer and elk winter range on the Tex Creek WMA, and deer and elk summer range on national forest lands.

Benefits: Protection and enhancement of these key parcels will assure that a migration corridor for mule deer and elk is maintained and that winter range conditions on the Tex Creek WMA are improved. Also, because many cover types would be protected, several other target species will benefit.

<u>Species</u>	HU's
Mule deer	2,572
Ruffed grouse	56
Yellow warbler	27
Mink	186
Malard	<u>48</u>
Total	2,889

costs: Protection costs are estimated to be \$615,740.00. Enhancement measures will include browse plantings on 400 acres of protected rangelands (about \$340.00/acre), fencing of plantings (about \$3,000,00/mile), and the conversion of agricultural land back to native range (about 250.00/acre). Annual operation, maintenance, and monitoring will be necessary to sustain the benefits of range improvements.

Advance Design	50,000.00
Implementation	<u>1,046,000.00</u>
Total	\$1,096,000.00
Operation and Maintenance	28,500.00
Monitoring	<u>5,700.00</u>
Total Annual Costs for Life of Palisades Project	\$34,200.00

WATERFOWL AND AQUATIC FURBEARER

The following alternative projects are listed in order of the priorities assigned by the interagency work group.

Sand Creek protection and waterfowl enhancement. -- Protect through acquisition of easements or fee-titles from willing sellers, and enhance, 4,320 acres and 4 miles of Sand Creek adjacent to IDFG Sand Creek WMA. The riparian area is currently overgrazed. Protection will result in an increased riparian area, which will be enhanced through construction of dikes to create 7 ponds, and construction of 50 islands. Seven landowners would be involved in this potential project.

Benefits: With protection and dike and island construction, and subsequent pond and marsh development, the project will result in protecting about 645 acres of riparian habitat, about 510 acres of aspen/Douglas fir mixed forest, and about 3,165 acres of sagebrush/grassland. The project will significantly benefit waterfowl (including trumpeter swans), shorebirds, ospreys, mink, beavers, muskrats, and other riparian-dependent nongame species. Ruffed grouse habitat will be protected from logging and aspen eradication. Acquisition of easements or fee-titles for the 3,165 acres of sagebrush/grassland will be necessary to protect the riparian area and acquire water rights tied to the land. An indirect benefit of this sagebrush/grassland area will be protection of sharp-tailed grouse and moose habitat and protection of a migration corridor used by elk and mule deer to reach winter ranges.

<u>Species</u>	<u>HU's</u>
Mallard	516
Canada goose	419
Mink	452
Ruffed grouse	410
Yellow warbler	115
Total	<u>1,912</u>

Costs: Estimated implementation costs include \$912,000.00 for protection of 4,320 acres; \$285,000.00 for 7 riprapped dikes 10 feet high; \$28,000.00 for 1 water control structure per dike; \$50,000.00 for 50 islands 100 feet long, 50 feet wide, and 6 feet high; **and \$3,000.00 for vegetating the dikes.** Operation, maintenance, and monitoring costs will be limited to the riparian area and the aspen/Douglas fir forest. Due to erosion and marsh plant encroachment, maintenance of island and open-water conditions will be necessary to sustain continued annual benefits of this project.

Advance Design implementation	50,000.00
Total	<u>1,278,000.00</u>
	\$1,328,000.00
Operation and Maintenance Monitoring	23,000.00
Total Annual Costs for Life of Palisades Project	<u>2,900.00</u>
	\$25,900.00

Grays Lake marsh enhancement. -- Much of the marsh at Grays Lake National Wildlife Refuge in eastern Idaho is presently covered by a dense stand of bulrush (Scirpus spp.). This project will enhance about 100 acres in the marsh at Grays Lake. This will be accomplished through a series of open water channels and adjacent berms.

Open water areas and berms will be non-continuous and constructed in segments varying from 50 to 60 feet long. The ditch alignment will be curvilinear to create an area of interspersed open water, emergent vegetation, and elevated berms. Ponds and berms will be spaced in an irregular pattern within a designated area to create maximum interspersed.

Benefits: Areas of open water interspersed with elevated berms will create sites usable by breeding pairs of waterfowl for nesting, roosting, and loafing.

<u>Species</u>	HU's
Mallard	80
Canada goose	70
Total	150

Costs: Costs for advance design include engineering design and application for appropriate permits. Costs for implementation of this project have been worked out by the USFWS and include mobilization/demobilization (\$8,000.00), site access improvements (\$7,500.00), ditch excavation (\$73,500), inflation (\$7,100.00), contingencies (\$9,600.00), engineering (\$14,400.00), and assessments (\$4,800.00).

Operation and maintenance is estimated to cost \$1,000.00 annually and will include inspection and repair of structure damage caused by wave action, muskrat burrowing, and natural deterioration. Monitoring (\$1,000.00 annually) of target species response to the impoundment will be required to assure that desired mitigation results are being obtained.

Advance Design	50,000.00
Implementation	<u>250,000.00</u>
Total	\$300,000.00
Operation and Maintenance	1,000.00
Monitoring	<u>1,000.00</u>
Total Annual Costs for Life of Palisades Project	\$2,000.00

NONGAME/RIPARIAN

The Interagency work group considered that protection of riparian areas on the SFSR and Henrys Fork Snake River was high priority for nongame species. The following project will also benefit riparian habitats and complement other mitigation measures in the riparian corridor.

South Fork Snake River levee fencing. -- This project entails fencing of 30 miles on the levees built to confine the flood plain of the South Fork. Riparian areas up to 0.5 mile wide are contained within the levees. The primary purpose of the fencing is to allow riparian pasture management.

Benefits: With fencing and grazing management, the project is expected to benefit about 1,300 acres of riparian habitat through increases in cottonwood seedling establishment and amounts of willows, grasses, and forbs. This will increase the habitat quality for dabbling ducks, aquatic furbearers, and many other riparian-dependent species.

<u>Species</u>	<u>HU's</u>
Black-capped chickadee	213
Yellow warbler	58
Mallard	259
Mink	65
Total	595

Costs: Estimated advance design costs include arrangements and/or agreements with public land management agencies and/or private landowners, and costs to design the project and arrange for its construction. Estimated implementation costs are based on 30 miles of fence at \$3,000.00/mile. Operation and maintenance costs are based on fence maintenance of \$250.00/mile per year, and \$3,000.00 per year to manage riparian pastures. Monitoring costs include habitat evaluations to assess the project's benefits, and the costs of riparian pasture management.

Advance Design	35,000.00
Implementation	<u>90,000.00</u>
Total	\$15,000.00
Operation and Maintenance	10,500.00
Monitoring	<u>4,000.00</u>
Total Annual Costs for Life of Palisades Project	\$14,500.00

UPLAND GAME

The following alternative projects were specifically designed to benefit ruffed grouse. The projects are listed in order of the priorities assigned by the interagency work group.

Tex Creek WMA aspen management. -- Enhance 50 acres of aspen annually for 10 years on the IDFG Tex Creek WMA in eastern Idaho. A bulldozer will be used to mechanically create openings in advanced age aspen stands where little regeneration is now occurring.

Benefits: This project will benefit ruffed grouse because of their close association with early successional stages of aspen, in addition to a variety of other wildlife including moose.

<u>Species</u>	<u>HU's</u>
Ruffed grouse	100

Costs: Total costs for use of the bulldozer are estimated at \$220.00/day. It is estimated that it will take about 10 days to mechanically treat 50 acres each year. Annual operation and maintenance, which is necessary to maintain stands in early successional stages, is estimated to cost \$20.00/acre. Annual monitoring of the response of aspen and grouse to treatments will be required.

Advance Design	4,000.00
implementation/Enhancement	<u>22,000.00</u>
Total	\$26,000.00
Operation and Maintenance	2,200.00
Monitoring	<u>1,000.00</u>
Total Annual Costs for Life of Palisades Project	\$3,200.00

Targhee/Caribou Forest aspen regeneration project. -- Prescribe burn and/or spray 2,050 acres of aspen/conifer vegetation to regenerate aspen and check conifer encroachment and replacement of the aspen type. This will promote early successional stages of aspen and improve habitat for ruffed grouse. This project follows the goals of the Targhee Forest Land Management Plan (1985).

Benefits: Because of their close association with early successional stages of aspen, this project will benefit ruffed grouse, In addition to a variety of other wildlife including moose.

<u>Species</u>	HU's
Ruffed grouse	410

Costs : Advance design work Includes preparation of an environmental assessment, project plan, and prescribed fire plan. Annual operation and maintenance will be necessary to keep aspen stands maintained in early successional stages. Annual monitoring of the response of aspen and grouse to treatments will be required.

Advance Design	9,500.00
Implementation	<u>42,500.00</u>
Total	\$52,000. 00
Operation and Maintenance	4,250.00
Monitoring	<u>2,900.00</u>
Total Annual Costs for Life of Palisades Project	\$7,150.00

Tex Creek WMA aspen protection/enhancement. -- Protect through acquisition of easements or fee-titles from willing sellers, and enhance, 1,290 acres of existing aspen stands near the IDFG Tex Creek WMA. Because private parcels that will be protected are not exclusively composed of aspen, a total of 4,500 acres will need to be protected to protect 1,290 acres of aspen. As a result, other wildlife species will benefit from this project.

Once protected, 250 acres of aspen will be mechanically treated. This treatment will create openings in advanced age aspen stands and favor early successional stages, therefore benefiting ruffed grouse.

Benefits: Although this project will primarily benefit ruffed grouse, other species such as mule deer, mallards, yellow warblers, and mink will also benefit as other habitat types are protected.

<u>Species</u>	<u>HU's</u>
Ruffed grouse	1,032
Mule deer	120
Yellow warbler	5
Mink	54
Mallard	<u>163</u>
Total	1,374

Costs: The cost of protection measures is estimated to be about \$820,200.00. This cost is based on the amount of rangeland (4,080 acres) and agricultural land (420 acres) that would be acquired. Annual operation and maintenance, which is necessary to maintain aspen stands in early successional stages, is estimated to cost \$20.00/acre. Annual monitoring of the response of aspen and grouse to treatments will be required.

Advance Design	55,000.00
Implementation	<u>871,200.00</u>
Total	\$926,200.00
Operation and Maintenance	5,000.00
Monitoring	- 500.00
Total Annual Costs for Life of Palisades Project	\$5,500.00

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APPENDIX A

Acronyms Used

BIA	- Bureau of Indian Affairs
BPA	- Bonneville Power Administration
cfs	- cubic feet per second
CUA	- Cooperative Use Agreement
DBERP	- Draft Bald Eagle Recovery Plan
GYE	- Greater Yellowstone Ecosystem
HEP	- Habitat Evaluation Procedure
HSI	- Habitat Suitability Index
HU	- Habitat Unit
IDFG	- Idaho Department of Fish and Game
MOU	- Memorandum of Understanding
O&M	- Operation and Maintenance
scs	- Soil Conservation Service
SF SR	- South Fork Snake River
TNF	- Targhee National Forest
USBLM	- U.S. Bureau of Land Management
USBR	- U.S. Bureau of Reclamation
USFS	- U.S. Forest Service
USFWS	- U.S. Fish and Wildlife Service
WDGF	- Wyoming Department of Game and Fish
WMA	- Wildlife Management Area (Idaho Department of Fish and Game)

APPENDIX B

Formal Comments

IDAHO

600 South Walnut • B.
Boise, Idaho 8



November 28, 1986

Mr. John Palensky, Director
Division of Fish and Wildlife, PJS
Bonneville Power Administration
P.O. Box 3621
Portland, OR 97208

Dear Mr. Palensky:

Enclosed is the Palisades Project Wildlife Protection, Mitigation, and Enhancement Plan. This planning effort was funded by the Bonneville Power Administration pursuant to section 1004(b)(3) of the Northwest Power Planning Council's Columbia Basin Fish and Wildlife Program. The Plan was prepared by the Idaho Department of Fish and Game in consultation and coordination with the U.S. Bureau of Reclamation, U.S. Forest Service, U.S. Fish and Wildlife Service, U.S. Bureau of Land Management, Shoshone-Bannock Tribes, Wyoming Department of Game and Fish, Peregrine Fund, Bonneville Power Administration, Northwest Power Planning Council, and Pacific Northwest Utilities Conference Committee.

The Department supports the content of this Plan. We think 100% of the wildlife losses identified in the Palisades Project Wildlife Impact Assessment should be attributed to the hydroelectric project purpose. We encourage the Northwest Power Planning Council and Bonneville Power Administration to consider and implement this Plan in a timely manner.

Sincerely,

A large, stylized handwritten signature in black ink, appearing to read "Jerry M. Conley".

Jerry M. Conley
Director

JMC/GAM/sa

Enc.

EQUAL OPPORTUNITY EMPLOYER

PNUCC

PACIFIC NORTHWEST UTILITIES CONFERENCE COMMITTEE

November 6, 1986

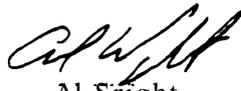
John Palensky - PJ
Bonneville Power Administration
1002 N.E. Holladay
P.O. Box 3621
Portland, Oregon 97208--3621

Dear John:

PNUCC recently received a copy of Idaho Department of Fish and Game's draft Wildlife Protection, Mitigation, **and** Enhancement Plan for the Palisades Project (BPA Project No. 86-73) for review and comment to Idaho. PNUCC does not intend to conduct a technical review of this plan or provide comments to Idaho at this time. We believe that this project and the other upper Snake River wildlife projects are very low priority, especially since hydro impacts and responsibility at these facilities are minimal. In light of this fact, we find the preliminary cost estimate for Palisades mitigation of over \$15.5 million particularly outrageous.

PNUCC recommends that BPA defer further wildlife planning at Palisades Dam as well as at other projects through 1989. This will provide time for the Council to fully address wildlife mitigation policy issues and provide the necessary direction for future wildlife projects. Should BPA proceed to fund wildlife plan development despite our objections, we will conduct our technical reviews as staff resources allow and provide comments on such plans directly to BPA and the Council at the appropriate time.

Sincerely,



Al Sright
Executive Director

PB:GH:138e

cc: Janet McLennan, BPA
Jim Meyer, BPA
Jan Carpenter, NPPC
Marty Montgomery, NPPC
Allyn Meuleman, IDFG

NOV 10 1986



United States Department of the Interior

FISH AND WILDLIFE SERVICE
BOISE FIELD OFFICE
4696 Overland Road, Roan 576
Boise, Idaho 83705

November 6, 1986

Jerry M. Conley, Director
Idaho Department of Fish and Game
Hearquarters
P.O. Box 25
Boise, Idaho 83707

Re: FWS-1-4-87-I-33

Dear Jerry;

This is our response to your letter of October 23, 1986, concerning the draft report of the Palisades Wildlife Protection, Mitigation, and Enhancement Plan. We have **reviewed** the document as it relates to our concerns for federally list species.

Under **informal** consultation, we **concur** with the objectives identified as "Preferred Protection/Ehancement Protects: for the pergrine falcon and bald eagl. The goals described under each project for these species will assist us in ~~me~~ing recovery goals for the state as described in the respective recovery plans. We also concur that costs associated with these projects are appropriate for t specific activities.

Sincerely yours,


John P. Wolflin
Field Supervisor

cc: FWS, AFA-SE, Portland

The Peregrine Fund, Inc.
World Center for Birds of Prey

for the study and preservation of falcons and other birds of prey



November 19, 1986

Jerry Conley
Director
Idaho Dept. of Fish and Game
P O. Box 25
Boise, ID 83707

Dear Mr. Conley:

Thank you for the opportunity to review the Wildlife Protection, **Mitigation** and Enhancement Plan for the Palisades Project. We wish to compliment Ms. **Allyn Menleman** on the content and development of the plan. Please accept this note as a supporting Letter. We feel very strongly that actions are required and that specifically the Peregrine Falcon should be part. Please feel free to call on us for assistance.

Sincerely yours,

A handwritten signature in black ink that reads "Bill Burnham". The signature is written in a cursive, flowing style.

William Burnham, Ph. D.
President
The Peregrine Fund, Inc.

WABpwb



United States
Department of
Agriculture

Forest
Service

Targhee
National
Forest

P.O. Box 208
St. Anthony, ID 83445

2620

November 19, 1986

Jerry M. Conley, Director
Idaho Dept. of Fish & Game
600 South Walnut, Box 25
Boise, ID **83707**

Dear *Jerry*:

We wish to document our support for the Palisades Wildlife Protection, Mitigation, and Enhancement Plan. In our opinion, the interagency team which prepared the plan, utilized the best professional expertise and techniques available. We support the suggested projects **and** recognize the need to have 100 percent of the projects funded to mitigate for the wildlife losses resulting from the Palisades project.

Sincerely,

JOHN E. BURNS
Forest Supervisor





IN REPLY
REFER TO:

6701

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Idaho Falls District
940 Lincoln Road
Idaho Falls, Idaho 83401

November 24, 1986

State Director
Attn; Allyn Meuleman
Idaho Fish and Game
600 South Walnut
Box 25
Boise, Idaho 83707

Dear Allyn:

We have received and reviewed the modifications to the text of the Palisades Wildlife Protection, Mitigation, and Enhancement Plan and find them to have incorporated our requested changes. Our staff fully supports the work and final product that has been produced. We would encourage the Northwest Power Planning Council to approve the package in its entirety because a conservative and realistic approach was used in the development of the plan and, without hydroelectric facilities being part of the project, the dam may not have been built.

The BLM wants to thank your agency for the opportunity to participate in the development of this plan. A coordinated effort such as this one provides a very sound resource document that includes the latest and best information available. If you need any more information from our office, please feel free to contact us.

Sincerely,


Lloyd H. Ferguson
District Manager



United States Department of the Interior

BUREAU OF RECLAMATION
PACIFIC NORTHWEST REGION
FEDERAL BUILDING & U.S. COURTHOUSE
BOX 043-550 WEST FORT STREET
BOISE, IDAHO 83724

IN REPLY
REFER TO PN 150

NOV 28 1986

Mr. Jerry M Conley
Director
Idaho Department of Fish and Game
600 South Walnut
Box 25
Boise, Idaho 83707

Dear Mr. Conley:

We received the Draft Wildlife Mitigation Plan for the Palisades Project (Northwest Power Act) which you sent on October 23, 1986. Our Minidoka Project office in Burley, Idaho, and our regional office staff have reviewed this plan, and we offer the following comments.

Page 14, last paragraph: To present a more accurate picture, the following information should be incorporated into this paragraph. The entire runoff of the South Fork Snake River passes through Palisades Reservoir, making a system operation involving other reservoirs possible. Major releases are made for flood control as required (averaging well over 1 million acre-feet per year), and irrigation releases are made as dictated by downstream water rights and demands (well over 3 million acre-feet of water is released to meet irrigation demands annually). The holdover storage permitted by the relatively recent Palisades storage rights also permits enough storage to provide for an annual average of 216,000 acre-feet of additional irrigation use, as needed primarily to meet the supplemental water needs of 650,000 acres in a dry year or a sequence of dry years (Reclamation 1951). As much of the total Palisades Reservoir releases as possible (averaging about 78 percent of total releases) is run through the Palisades Powerplant, as limited by the hydraulic capacity of the plant.

Page 15, paragraph 1: This paragraph is incomplete. The paragraph should also state that the Palisades flood control operation was developed in recognition of the fact that the levees would be in existence and that the flood control benefits credited to Palisades Reservoir were reduced by the amount of benefits credited to the levees and to other control structures (Reclamation Definite Plan Report 1951).

Page 15, paragraph 3: We believe that allocating the hydroelectric share of wildlife losses caused by multipurpose dam and reservoir development on the basis of project operational characteristics or repayment requirements is inappropriate. We believe that retroactive wildlife mitigation program costs at Bureau of Reclamation projects should be allocated to the hydroelectric function in the same proportion as prior construction costs have been assigned

to that function unless congressional authorities provide otherwise. This is the procedure used by Reclamation in new project planning, and it provides an equitable distribution of costs among functions benefiting from project development.

If the Palisades Project were built today, any mitigation costs required because of joint use facilities would be allocated to the functions involved based on the percentages of remaining joint costs. This handling of mitigation costs is spelled out in Reclamation Instructions. (This allocation of the Palisades joint costs is shown in the second tabulation which follows.)

The current Palisades Project cost allocation is a September 1969 allocation which was approved by the Secretary of the Interior in March 1970. Costs were allocated as follows:

<u>Project Purpose</u>	<u>Allocated Cost</u>	<u>Percent of Total Cost</u>
Irrigation	\$12,372,500	19.7
Power	20,131,426	32.1
Flood control	29,643,000	47.2
Fish and wildlife	492,120	.8
Recreation	<u>144,415</u>	<u>.2</u>
Total	\$62,786,461	100.0

The allocation was done under both the "alternative justifiable expenditure" and the "priority of use" methods of allocation, and the final allocation is an average of the two methods. Although the draft wildlife report states that "the 'priority of use method' has not been used by Reclamation for many years and is no longer considered a suitable method," this is evidently a misinterpretation of informal information provided by Reclamation. The priority of use method is still a valid method of allocation, although newer, more sophisticated methods are frequently used.

In the cost allocation shown above, joint use costs total about \$45.4 million (costs of features serving more than one purpose exclusively). By using a combination of the two allocation methods, the 945.4 million of joint costs were allocated as follows:

	<u>Percent</u>
Irrigation	27.2
Power	7.5
Flood control	<u>65.3</u>
Total	100.0

The Assistant Secretary of the Interior determined on August 9, 1957, that the allocation methods shown in House Document No. 720, 31st Congress, 2d Session (which included Bureau of Reclamation Supplemental Report of June 1949 on the Palisades project) should continue to be used for the Palisades Project, except

that allocations to recreation and fish and wildlife were limited to the cost of specific facilities. As a result, joint construction cost remaining after deducting the joint costs allocated to flood control were allocated between irrigation and power using the alternative justifiable expenditure and the priority of use methods and averaging the results of each method. These two methods were used in House Document 720.

It has been suggested that it might be possible to relate wildlife losses to the total power allocation. If it were concluded and could be supported that wildlife losses were the result of power operations rather than the existence of joint use facilities (the dam and reservoir), then assigning the mitigation cost on the basis of the total power allocation (32.1 percent) rather than the joint cost (7.5 percent) could have some merit.

Page 15, last paragraph: Regarding the second sentence, the Palisades Project may have been financially feasible without the hydropower component since, as explained below, it appears to have been economically justified by a comparison of benefits to costs without the power function. Congress has in the past authorized projects with little or no reimbursement involved, and it is possible that project formulation could have been modified at that time.

In the same sentence, it should be noted that hydropower is to repay 78 percent of reimbursable project costs (rather than 80 percent as shown), with irrigation paying 22 percent; hydropower would repay 43 percent of total project costs. These repayment percentages are based on a Cost and Repayment Statement for the Palisades Project as of September 30, 1985 (USBR) and reflect the deletion of repayment obligations associated with the Fort Hall and Michaud Flats Projects which are not directly associated with Palisades but are included with Palisades for cost accounting purposes.

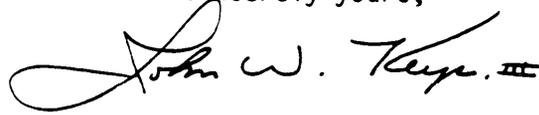
Regarding project revenues, it is difficult to see how a limitation on irrigators' ability to pay (in the plan as authorized by Congress) and the nonreimbursable nature of the flood control function because of the widespread location of the beneficiaries (as authorized by Congress), should leave hydropower to mitigate 100 percent of wildlife losses because of different repayment requirements on the power function.

Project benefits and associated costs are used in project formulation and analysis, and as an analytical basis for the allocation of project costs. As a test in the formulation of the Palisades Project, each project function has to be justified by annual benefits in excess of associated annual equivalent costs. This same test was met in the allocation of costs. In considering the relative importance of the project functions, it should be noted that the Palisades Project at full reservoir capacity and as analyzed in the 1970 cost allocation would have been justified by a benefit-to-cost ratio in excess of 2 to 1, even with all power benefits and costs deleted.

We appreciate the coordination we have had with your staff in the formulation of this mitigation plan. With the exception of our stated differences in

regard to the method used for assignment of mitigation costs to hydropower, we believe the plan offers acceptable avenues for addressing wildlife losses which you have identified.

Sincerely yours,

A handwritten signature in black ink that reads "John W. Keys, III". The signature is written in a cursive style with a large initial "J" and a prominent flourish at the end.

Regional Director

Game and Fish Department

BILL MORRIS
DIRECTOR

December 2, 1986

Mr. Jerry M Conley, Director
Idaho Fish and Game
600 S. Walnut, Box 25
Boise, ID 83707

DEC 5 1986

Dear Jerry:

We have reviewed the final draft of the Palisades Wildlife Protection, Mitigation and Enhancement Plan. We support the plan. Wyoming's wildlife habitat losses should be adequately mitigated if recommendations of this interagency work group are followed. We concur with the interagency work group's rationale that power beneficiaries should take full responsibility for mitigation of wildlife losses due to the development and operation of the Palisades hydroelectric project.

We appreciated your Department's coordination with our personnel in developing this mitigation plan. Please continue to keep our personnel informed of the progress of mitigation.

Sincerely,


Bill Morris, Director

WYOMING GAME AND FISH DEPARTMENT

EM rv

The SHOSHONE-BANNOCK TRIBES

FORT HALL INDIAN RESERVATION
BOISE (208) 238-3808
(208) 238-3867



TRIBAL FISH & GAME
P O BOX 300
FORT HALL IDAHO 83203

24 November 1986

Mr. Jerry Conley, Director
Idaho Department of Fish and Game
Box 25
Boise, Idaho 83707

Dear Mr. Conley:

This letter is written in response to your request for comments on the draft "Wildlife Protection, Mitigation, and Enhancement Plan-Palisades Project".

The Shoshone-Bannock Tribes agree with the use of the habitat evaluation procedure by the interagency work group to assess the benefits of the preferred mitigation plan to wildlife. The Tribes also agree with the groups findings that a total of 37,065 habitat units were lost due to the inundation of the Palisades Reservoir area and with the groups selection of the protection/enhancement projects which should provide benefits of an estimated 37,064 habitat units.

Thank you for the opportunity to comment on this document and for providing the opportunity for our Tribal Wildlife Biologist to work on the evaluation team.

Sincerely,


Arnold Appenay, Chairman
Fort Hall Business Council

DMC/vsl



United States
Department of the Interior

Fish and Wildlife Service

Lloyd 500 Building, Suite 1692
500 N.E. Multnomah Street
Portland, Oregon 97232

In Reply Refer To:

Your Ref:

December 15, 1986

Jerry M. Conley, Director
Idaho Department of Fish and Game
600 South Walnut Street, Box 25
Boise, Idaho 83707

Reviewed: DEC
Copies: <i>6</i>
NO. 036 REPL

Dear Mr. Conley:

The Fish and Wildlife Service (Service) has reviewed the draft report for the Palisades Wildlife Protection, Mitigation, and Enhancement Plan. This plan is the product of an interagency study team, and the listed recommendations and priorities reflect the consensus of team members.

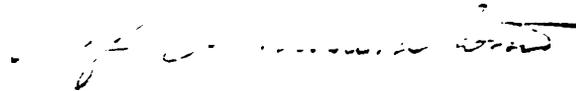
The hydropower allocation discussion in the report was indepth and informative. The Service would like to add some additional insights with regard to the Fish and Wildlife Coordination Act (Act). This project was built prior to 1958 when the amended Act was passed by Congress that mandated that fish and wildlife receive "equal consideration" with other project purposes. The 1958 Act also provided for enhancement of fish and wildlife values where possible and required that compensatory actions be taken when unavoidable adverse impacts to fish and wildlife occur. Prior to 1958, federal water projects were built with little, if any, mitigation for fish and wildlife habitat losses.

If the Palisades Project were being planned today, the Service, under the authority of the Act, would investigate impacts associated with the entire project area, including irrigation lands and levees built by the Corps of Engineers which also constitute the project. The impacts to fish and wildlife associated with the entire project area are much greater than those reported for the reservoir area alone in an earlier loss assessment report. If the Power Council desires to allocate mitigation funding between the various project purposes, then the entire project area should be included in this analysis. This action would be consistent with the intent of the Act.

The study team discussed the allocation topic in detail at the beginning of the earlier loss assessment. At that time, the irrigation and flood control project features that exist downstream of the reservoir were reviewed. For the most part, these are non-hydroelectric power project features (even though the relationship between power need and irrigation development was recognized) and the group decided to investigate the reservoir area alone. It was agreed, at that time, that impact to wildlife habitat associated with reservoir inundation should be allocated to the hydroelectric power purpose and there would be no need to evaluate the downstream flood control and irrigation project features. If proper mitigation were provided for the reservoir area, then mitigation for losses associated with hydroelectric development would be considered complete.

If mitigation goals described in this document are achieved, the future outlook for many important wildlife species (e.g. bald eagles, Rocky Mountain elk, peregrine falcon, whooping crane) will be much improved.

Sincerely,



Regional Director

cc: John Palensky, BPA
BLM, Idaho Falls Dist., Idaho Falls
FS, Palisades Ranger Dist., Idaho Falls
Boise